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Improved Eave-Trough Machine.

The accompanying engraving is an illustration of a new and improved means of manufacturing eave troughs, or the gutters that are suspended under the roofs of houses to carry off rain and drippings. These troughs are made from sound timber, in continuous lengths of any dimensions desired, and are afterward joined together by a metallic coupling inserted in each end, as shown in the small figure. The troughs themselves are cut from planks, and thoroughly dressed, shaped, and finished, in one operation; when done, they are the best that can be produced. A glance at the machine is nearly sufficient to enable any one to understand it; but we append the following description detailing the several parts, so that all may comprehend the arrangement. The frame, A, is of wood, and has a line of shafting, B, running in boxes at one end; this shaft is driven from any power provided for the purpose. The barrel cutters, C, have mortises in their sides, in which the teeth of the gears, D, mesh; these latter are driven by belts from the shaft, B, and run in the bearing, E; these bearings have no binders or caps, the same being unnecessary, as the strain is all on the back. A metallic band, F, is provided, however, which keeps the dirt from entering and cutting the bearing, and also prevents the cutters from chattering or vibrating when at work; this band is tightened by the thumb-screws, *a*.

The stuff to be worked up sets on a sliding carriage, G, which is driven by a rack and pinion; these latter appurtenances are driven from the main shaft, B, by a worm and worm-wheel, H. The stuff is held in place by the two cams, I, having knife edges on their lower sides, which enter the timber and hold it while the cutters are at work; these cams are regularly advanced by the screws, which are connected by the belt, J, passing over both the pulleys.

At the entrance of the stuff to the barrel cutter, there is placed an upright shaft, K (driven from the main shaft), which carries a cross bar, L, on the top; this bar is adjustable, and has two cutters, M, one in each end, which are also movable, and fastened by set screws. In the vertical shaft itself there are two other cutters, N, fixed, which dress the edges of the timber before it passes to the barrel cutters; the first or horizontal cutters are for planing the sides of the trough. The operation of this machine is as follows:—On being started, the cutters on the vertical shaft dress the stuff, O, while the advancing feed carries it on to the small barrel cutter, which cuts out the hollow of the trough; the chips are swept away from behind the barrel, so that it will not clog by the wings or strips, *b*, fastened to the barrel itself; the plank continues on until it meets the larger barrel cutter, which separates the trough from the plank and completes the operation. When the carriage is to be run back, the worm-wheel shaft on which this pinion is fastened, is thrown out of gear by a lever not shown, and the slide, P, in which the upper end of the worm-wheel shaft runs, is retained by a spring on its equivalent; so that the pinion cannot fall into gear and smash the teeth on it and the rack. During these processes no more stuff is wasted than that taken up by the width of the cutters; the small cylinders produce a baton which is useful in building and decorating houses, &c. This is a good feature. The operation above described can be continued infinitely. The machine is very strong and simply constructed, and as every one can see will do its work to perfection when kept in good order.

Fig. 1.

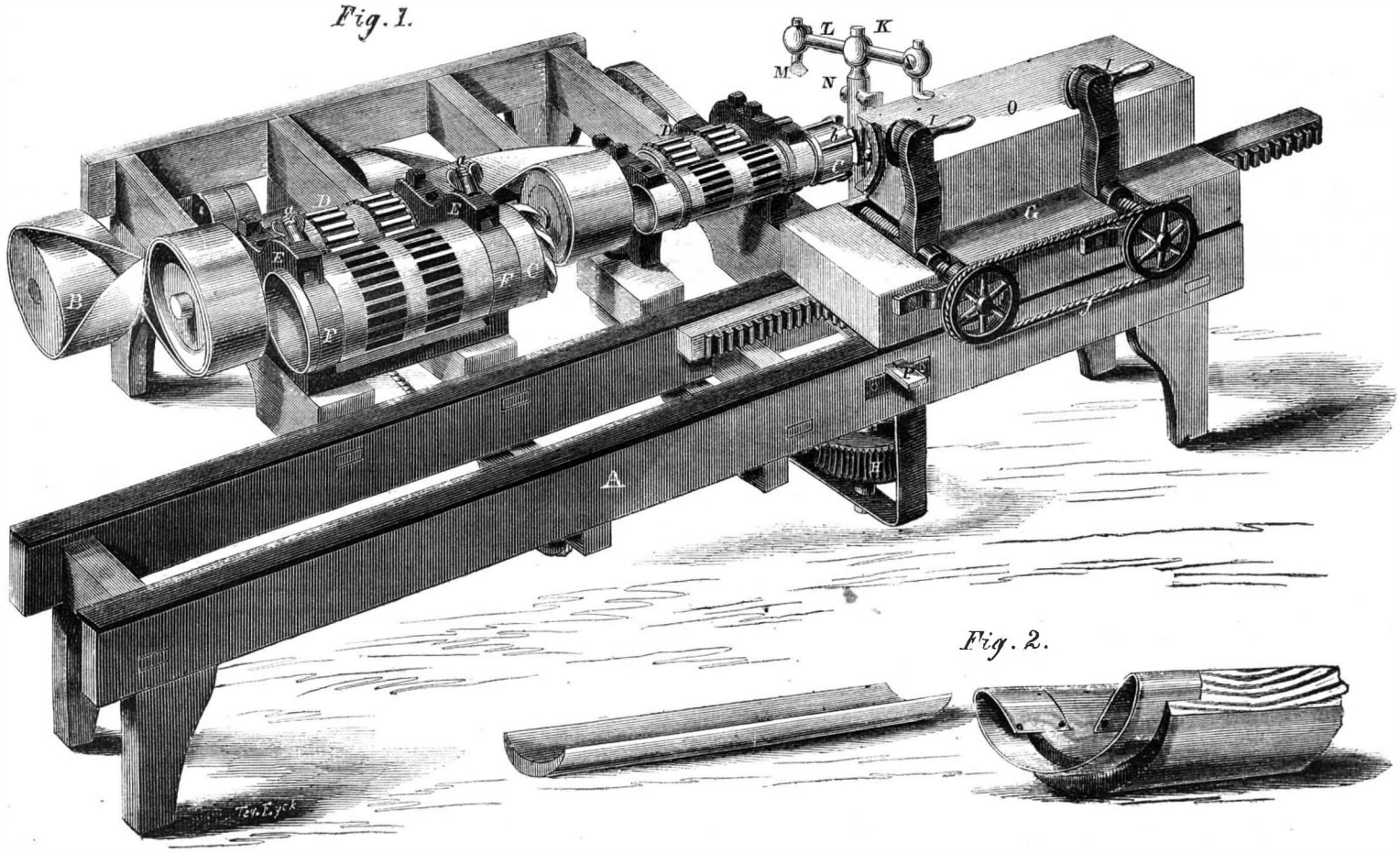

Fig. 2.

Respecting his machine, the inventor says:—"It will cut 2,000 feet per day; 1,000 feet of plank will make 2,000 feet of trough, and at the same time it makes 2,000 feet of the half-round batons or strips for roofing. The batons, sold at low figures, will pay all the expense of manufacturing the trough. I have had one of the machines in operation in Elmira for the last three years, and have hardly been able to supply the demand for the troughs. They can be sold at one-fourth the price of tin, and make large profits. These troughs have another advantage over tin—they will last much longer, and can be put up by any inexperienced person."

This machine was patented on Feb. 19, 1861, by Mr. Arcalous Wyckoff, of Elmira, N. Y. For further information address him at that place.

WYCKOFF'S EAVE-TROUGH MACHINE.

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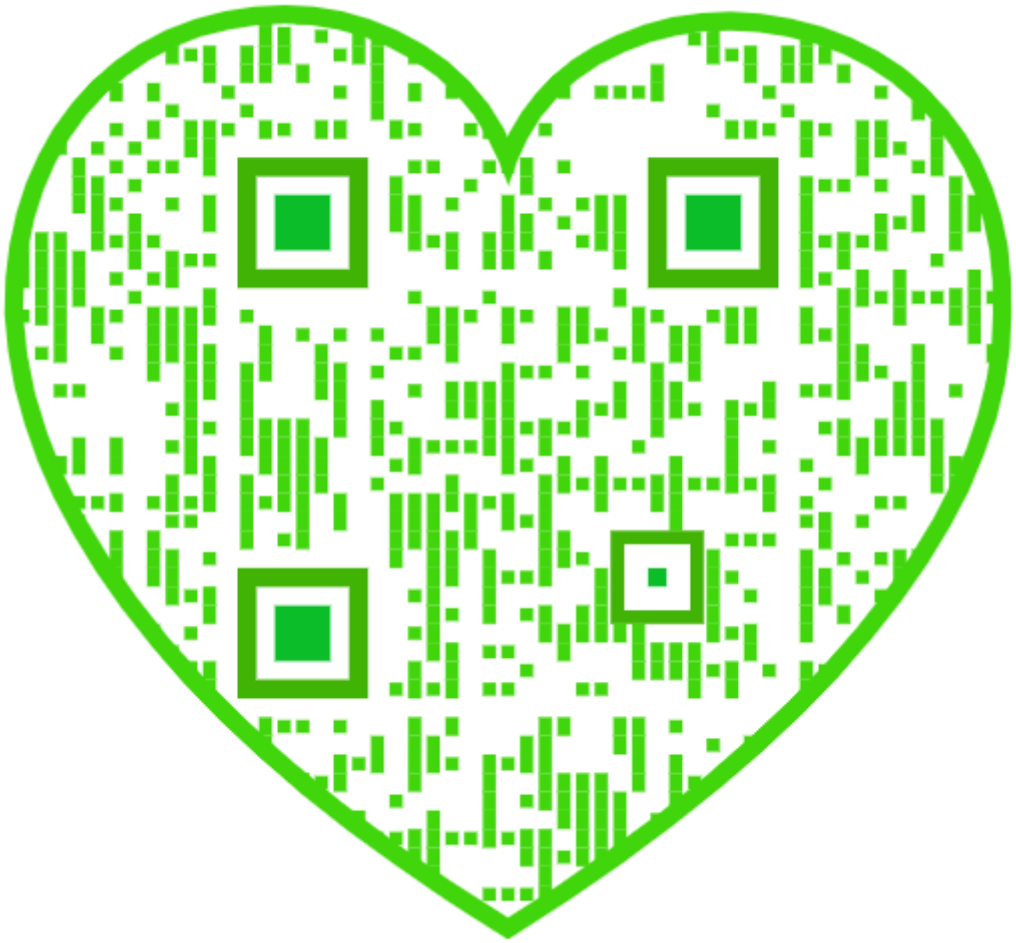

The Capacities of Government and Private Armories.

In addition to the large number of muskets manufactured at the Government works in Springfield, and which amount to upward of three hundred thousand per annum, there are a vast number of private establishments throughout the Northern States, which turn out from two to five thousand muskets per month each. These various manufactories are situated at Hartford, Norfolk, Windsor Locks, Norwich, Middletown, Meriden and Whitneyville, Conn., Providence, R. I., Manchester, N. H., Windsor, Vt., Trenton, N. J., Bridesburg, Pa., and New York City, Watertown and Ilion, N. Y. Besides these, there are more than fifty establishments where separate parts of the musket are manufactured in large quantities, and purchased by Government to supply the places of those injured or destroyed in the service. It is estimated that the private armories alone are manufacturing monthly upwards of sixty thousand rifled muskets. The Government contracts for these arms extend to January next, and the total number which will then have been produced will be enormous. The cost of manufacturing a musket at the Government works is estimated at about $9; but the contract price to the private arms-companies is $20 for those which equal the Government standard in every respect, $19 90 for those which lack a little in finish, $19 for the next grade, $18 for the next, and $16 for the lowest and poorest which are accepted.

As the arms are finished, they are sent away to the various Government arsenals; those made in New England to Watertown, Mass, where they remain until the exigencies of the service require them. At the present time, there is a sufficient number of new rifled muskets of the best quality stored in the various arsenals to arm the entire levy about to be called into the field, and should the war continue so long, there will be enough manufactured during the next twelve months for a new levy of over one million of men. These arms, it must be remembered, are entirely independent of those ordered by the respective State governments, which would swell the amount very largely.—*Atlantic Monthly.*

Purchasing Colored Goods.

When a purchaser has for a considerable time looked at a yellow fabric, and is then shown an orange or scarlet piece of goods, it is liable to be taken for a crimson; for there is a tendency in the retina, excited by yellow, to see violet. The left eye having seen red during a certain time, has an aptitude to see in succession green, the complementary to red. If it then looks at a yellow, it perceives an impression resulting from the mixture of green and yellow. The left eye being closed, and the right, which has not been affected by the sight of red, remaining open, it sees yellow, and it is also possible that the yellow will appear more orange than it really is.

If there is presented to a buyer, one after another, fourteen pieces of red stuff, he will consider the last six or seven less beautiful than those first seen, although the pieces be identically the same. What is the cause of this error of judgment? It is that the eyes having seen seven or eight pieces in succession, are in the same condition as if they had regarded fixedly, during the same period of time, a single piece of red stuff; they have then a tendency to see the complementary of red, that is to say, green. This tendency goes, of necessity, to enfeeble the brilliancy of the red of the pieces seen later. In order that the merchant may not be a sufferer by this fatigue of the eyes of his customers, he must take care, after having shown the latter seven pieces of red, to present to him some pieces of green stuff, to restore the eyes to their normal state. If the sight of the green be sufficiently prolonged to exceed the normal state, the eyes will acquire a tendency to see red; then the last seven red pieces will appear more beautiful than the others.

FOREIGN STEAMSHIP TRADE TO AMERICA.—The total number of steamers now leaving Europe for North America is 396. Of these 294 sail from Liverpool, 38 from Glasgow, 26 from Hamburg, 26 from Bremen, and 12 from Havre. Each departure says, "Sir Cusack Roney" is counted as a steamer, although the same vessel may make eight or ten clearances in the course of a year. This is truly a Hibernian way of reckoning.

Greenbacks---Counterfeiting.

Mr. W. L. Ormsby, Jr., of this city, read an interesting paper on this subject at the meeting of the Geographical and Statistical Society at Clinton Hall, on the evening of the 1st inst. He showed that at least five-sixths of our bank-note issues are counterfeited, and assigned as the reason the similarity of different notes in name and artistic design, and the peculiar system of their construction in detached parts. The reason why the greenbacks have not been more successfully counterfeited is because they are comparatively new and original in design, and unlike any other notes; and the denominations and ornaments are in a measure interwoven so as to prevent alterations. By the common practice of bank-note engraving, the contractors retain the plates in their possession as their property. This has led to a similarity of the notes of different banking corporations, by using the same dies for the production of their plates, thus affording scope for counterfeiting. Upon learning this state of things, Mr. Chase determined that the Government should own the plates from which its notes are printed. He has accordingly made it incumbent upon the contractors for the new national currency to acknowledge the Government ownership of the dies, plates, and materials used in producing that currency. This, together with the adoption of the plan of blending the denomination and ornamental portions, will, it is believed, secure greater immunity against the arts of the counterfeiter.

Washing Sheeps Wool.

A convention of wool growers was held at Cleveland, Ohio, on the 16th inst., at which a committee reported as a subject for discussion:—

That farmers ought not to wash their sheep before shearing.

The resolution was discussed in a very free and easy manner. Some of the growers seemed chiefly concerned to know how they could sell their wool to the best advantage without washing Others wanted to know how they could sell to the greatest profit, washed or unwashed. An earnest call was made on manufacturers for their objections to unwashed wool, as it was known they do object, and require a deduction which growers think unreasonable. A manufacturer, now a grower, responded to the call, in a very fair statement of his experience as a manufacturer and a grower. But he was decidedly in favor of washing before shearing.

Quite a number of the speakers stated their experience as to washing, and their difficulty in selling without washing. The Eastern sheep sellers who were present were decidedly opposed to washing; chiefly, because as they said, it affected the appearance of the wool, and some even went so far as to affirm that it damaged the wool. This, however, was flatly contradicted by others of equal experience. Much stress was laid upon the time and manner of washing, and especially the state of the weather. Rainy days were denounced as totally unsuitable for this process, as it is of great importance that the wool should dry as soon after washing as practicable, to avoid giving colds to the sheep. It was asserted that when sheep are washed early, and not sheared for several weeks afterwards, the wool will weigh more than the unwashed wool weighed at the time of washing.

Petroleum Refineries in Cleveland, Ohio.

We learn from the Cleveland *Herald* that there are sixteen petroleum refineries in the vicinity of that city, in which 103,691 gallons of the refined oil were produced during the month of August last, of which 23,709 gallons were for exportation. This does not include the heavy lubricating oil and the benzoin also obtained from the crude petroleum. There are 39 refining stills in operation in these refineries; the petroleum is obtained from the wells in Pennsylvania, costs from $6 to $7 per barrel, of 40 gallons at the wells, and yields about 80 per cent of pure illuminating fluid, besides some benzoin and heavy oil. Some tar is also produced. Before the oil can be sold it has to be inspected twice—once for quality and once for quantity. The average price for it at Cleveland is 65 cents per gallon. There are new works going up every day in almost all parts of the city, and the capacity for refining will be increased from twenty-five to fifty per cent during the present year.

How "Antiques" are Made.

Upon this subject an English magazine says:—"Some fraudulent flint implements were recently detected at Winchester. They were offered for sale by a poor laboring man, who stated that he had found them in a barrow. Upon being much pressed, however, the man confessed the forgery, and for a small consideration showed the correspondent the art and mystery. Pulling out of his pocket a small dirty bag, he took from it a common carpenter's awl and the hasp which goes over the staple of a padlock, and then taking from another pocket some pieces of flint, he sat down, and holding the flint dexterously between his thumb and finger, and resting his hand upon his knee, he soon formed a beautiful specimen. The awl he used for making the angles at the base and rounding the barbs. The man's skill and quickness were remarkable, being, as he stated, the effect of several years' practice in this art. It should be added that the long portion of the hasp formed the handle, and the circular part the hammer on which he broke the flints."

[Not long ago an individual came into this office and practised the same operation before us. With a jack knife and a hammer he soon made "Indian arrow heads" in great profusion. Doubtless the manufacturers of aboriginal curiosities at Niagara Falls understand these little tricks of trade very well. —EDS.

Science in the Color of Furniture.

Nothing contributes so much to enhance the beauty of a stuff intended for chairs, sofas, &c., as the selection of the wood to which it is attached; and, reciprocally, nothing contributes so much to increase the beauty of the wood as the color of the stuff in juxtaposition with it. We should assort violet or blue stuffs with yellow woods, such as citron, maple, satin-wood, &c. Green stuffs with rose or red-colored woods, as mahogany. Violet or blue-grays are equally good with yellow woods, as green-grays are with the red woods. But in all these assortments, to obtain the best possible effect it is necessary to take into consideration the contrast resulting from hight of tone; for, a dark-blue or violet stuff will not accord so well with a yellow wood as a light tone of the same colors; and it is for this reason that yellow does not assort so well with mahogany as with a wood of the same color, but not so deep. Among the harmonies of contrast of tone, ebony or rosewood permits its employment with light stuffs to produce contrasts of color. It can also be employed with very brilliant, intense colors: scarlet, aurora, flame-color, &c.

Labor Lost.

The California *Farmer*, alludes to the clever work of an individual of that state who built a number of small and intricate articles inside of a great jar; such as a reel 4 inches long, arms 2½ inches wide, with silk already reeled on it, a star on silk winder, reel put together and silk reeled inside the bottle; two pulley blocks, 6 pieces each, these were put together inside the bottle; a miner's pick 3 inches long, with handle 4 inches long; hand ax, 2 inches long; an ox yoke 4 inches long, 2 wide, the ring bolted and pinned complete, &c.

We have seen a number of similar articles at fairs, and felt pained to think that those possessed of such patience and skill should waste it in the manner specified. If any one has a desire to see what he can do in the way of devising something remarkably ingenious, let him go to work in a legitimate way to lighten the labor of the world, and not fool away valuable time in making gimcracks unworthy the attention of a schoolboy.

THE COD FISHERIES.—An old fisherman has petitioned the Government, at Washington, to intervene if possible, to prevent the wholesale destruction of the codfish spawn. He recommends that it should be cast into the sea or buried in the sand, by which means the greater part might be saved. The fish, he says, may be dead, but the spawn are not. The fishermen who visit the Banks of Newfoundland from the United States and France, as well as those resident at the fishing grounds, are in the habit of destroying the spawn, which, unless corrected, must prove disastrous to the fishery in future years.

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England on American Artillery at Fort Sumter.

The following is from the *Army and Navy Gazette* (London) :—"It may be concluded as certain that the guns used by Gillmore were Parrott's rifled ordnance. Their work has been effectually done. Had such guns been available in the trenches before Sebastopol, the Allies would have made short work, not only of the Redan and Malakoff, and *bastion du mât*, but of the shipping and of the forts at the other side of the harbor. It must not be supposad that Sumter was a flimsy, gingerbread fort. It was constructed of a peculiar kind of hard, close brick, six and seven feet thick; the arches of the casemates and the supporting pillars were of 8 and 9 feet in thickness. The faces presented to the breaching batteries must have subtended at 3,500 yards, an exceedingly small angle, and the elevation of the fort was low. But so great was the accuracy of the fire that a vast proportion of the shots struck it; so great the penetration, that the brickwork was perforated 'like a rotten cheese;' so low the trajectory, that the shot, instead of plunging into, passed through the fort, and made clean breaches through both walls. Now, the guns that did this work cost, we believe, just one-fourth of our ordnance, cwt. for cwt.; they are light and very easily handled. The gun itself is finely rifled, with grooves varying from four and five in number for small calibers, to six and seven for the larger; but, as Mr. Parrott is still 'experimenting,' no settled plan has been arrived at, and all we know is that the pitch is not so sharp as is the case in our rifled guns. The projectile is like the conical Armstrong, and has a leaden sabot and coating—at least it is coated and based with some soft metal.

"In this journal the attention of the Government authorities has been called again and again to the Parrott and Dahlgren guns. The Americans have constructed cannon of calibers which to us are known only as of theoretical and probable attainment, and they have armed batteries hundreds of miles from their arsenals, with the most powerful guns ever used in war, which have been carried by sea and in stormy waters to the enemy's shores. Before such projectiles as these guns carry, the breaching of masonry, whether of brick or stone, is a question of short time. And, in face of these facts, we are obliged to record that our scientific officers are of opinion that our 'best gun for breaching purposes is the old 68 pounder!' Why, we know what that can do! We know that at 3,500 yards its fire would be about as effectual as that of Mons Meg. These trials at 200 yards are perfectly fatuous, if no other results than these, or such as these, be gained by them. It is of no use saying Sumter was of brick; it was at least as good a work as most of our existing fortifications, and infinitely less easy 'to splinter up' than a work of granite or rubble masonry. In substance it resembled very much our martello towers on the beach at Hythe. Have we any gun which could breach one of these at 3,500 yards? . . . The authorities have had no experience of the effect of such shot as the Dahlgrens propel. They have not got the guns to discharge them. When next the ordnance officers and gentlemen meet, let them apply their minds to the little experiments the Americans have been making for their benefit at Sumter. It is astounding to see what progress has been made in artillery since the Crimean war."

MISCELLANEOUS SUMMARY.

THE WAY TO CARRY PETROLEUM OIL.—The tanked ship lately arrived in the Mersey from Philadelphia, with a cargo of crude petroleum oil, in bulk, belonging to the Liverpool and Ramsey Oil Refining and Chemical Works Company. This is the first iron-tanked vessel with petroleum oil that has arrived in Liverpool. The *Jane* was specially constructed for conveying oil from America to the company's works at Ramsey, where it is discharged into hermetically sealed floating tanks which are moored in the river, thus preventing the smell and waste from leakage so much complained of. The vessel made the passage in 24 days.

IT is stated, on the best authority, that out of two millions of dollars of postal currency that have been canceled and burned, not two hundred were counterfeit. The imitations are poor, and easily detected.

BEWARE OF REDUCED GAS LIGHTS.—In the Fire Marshall's Report for this city, he says :—"Many persons have a habit of lowering the gas light in their bedrooms to a faint jet at night. This, to say nothing of its pernicious influence upon the health, may be productive of serious accidents. When the gas is reduced so low, a very slight cause—the buzzing of a fly even—will serve to put it out, and the sleeper is left to inhale a poisoned atmosphere, or to incur the risk of an explosion should any one chance to enter the room with a light. Where gas lights are thus lowered, a glass should always be used as a protection to them. Many fires have occurred in consequence of the dim light, not noticed after sunrise, on the window being opened by the occupant or servant; the curtain is blown against the burner and a fire ensues."

TELEGRAPHIC BLUNDERS.—The following specimens of the degree of intelligence exercised by the Submarine Telegraph Company is taken from the columns of a London paper:—"36, Cannon street, Sept. 7. Sir,—We enclose a telegram just received, *via* Suez, from our Sydney firm, Messrs. Willis, Merry and Co., which is quite unintelligible to us, excepting the words 'yourselves sold.' This we certainly are, as we pay to the Submarine Telegraph Company £3 for such information, which comes to us monthly in this mutilated form. We are, Sir, your obedient servants, W. L. Merry and Co. Telegram:—'Market unaltered decline probable market very active limit land ten Mansfield one Spence two yourselves sold hundred.'" Monument-yard, Sept. 8.

THE AIR-BLADDER OF FISHES.—The use of the air-bladder of fishes still puzzles the *savant*. M. Moreau has informed the Academy of France that, by his experiments, it must be considered as an oxygen reservoir, filled for the sustenance of the life of the fish. Perch, when put in a situation in which they were unable to renew the oxygen of the air-bladder, were asphyxiated. The quantity of oxygen in the air-bladder diminished proportionably with the duration of the experiment; and when it arrived at zero, the fish died.

REMARKABLE OCCURRENCE.—A negro cook in one of the regiments on Morris Island lately conceived the idea of making sinkers for fish lines out of the lead around Parrott shot. To this end he placed a shell in a stove and sat down, ladle in hand, to catch the molten lead as it fell. Just about the time the lead should have fused, the stove separated into very minute fragments, and the last seen of the smelter was a series of involuntary gymnastics creditable to his agility but unpleasant from their abruptness.

THE Camden (N. J.) *Journal*, states that a large woolen manufactory is now being erected on Cooper's Creek, near that place. It will be the most extensive in New Jersey, as more than a million of dollars are to be invested in the buildings, machinery, and stock. It is to be only two stories high, but will cover an extensive area, and give employment to about 300 persons.

TO DESTROY INFECTIOUS AIR.—At a late meeting of the British Scientific Association at Newcastle, Dr. Richardson said the best way to destroy organic poison in rooms was to place iodine in a small box with a perforated lid. During the epidemic of the small-pox in London, he had seen this used with great benefit. Dr. Murray Thomson said charcoal was now used in the hospitals in India with beneficial effect. It was hung up in bags from the rafters.

ABOUT 300 men are now engaged in gold mining on the Chandiere river, near Quebec, C. E. The gold found there is in the form of small pellets, and is very pure; but the searching for it is tantalizing. Some men will labor for days without obtaining a single grain, while others will make about $50 per day.

THE extensive establishment of John A. Roebling, for the manufacture of wire rope, Trenton, N. J., is driven to its utmost capacity. Mr. Roebling is now constructing an extensive bridge over the Ohio river, Cincinnati, which will cost about $1,500,000.

THE Newark (N. J.) *Advertiser* states that business is very lively in that city at present. Hat manufacturers especially are unable to complete their orders as fast as is desired.

Mechanical and other Items of the War.

A large Martin boiler, intended for the United States gunboat *Sunapee*, burst in the Washington Iron Works, at Newburg, N. Y., where it was being tested. Several persons were fatally scalded, and the buildings were demolished. This is the first case on record, we think, of this sort of boiler exploding. The loss, amounting to $25,000, falls on the company.

THE Burnside Rifle Factory, at Providence, R. I., had not fairly got in operation when the war commenced; its resources were at once turned to supplying the Government, and within the past year it has been enlarged to nearly double its former capacity. It now gives employment to 540 hands, and turns out 100 finished rifles per day. The ammunition is also furnished in a metallic cartridge ready for use.

Mr. C. W. Whitney, the designer and builder of the *Keokuk*, associated with Messrs. Johnson & Higgins, has entered into a contract with the Government to raise the above vessel, now lying sunk off Morris Island. The work is to be prosecuted at once.

Work on the iron-clad battery *Tecumseh* is being pushed forward very rapidly. The turret is now being placed upon the vessel, and she is expected to be entirely completed, ready for service, in a few weeks.

THE first vessel built on this Continent, says the *Historical Magazine*, was the *Virginia*, of Sagadoc, which made her first voyage in 1608, to Europe.

THE Army of the Potomac used no less than 20,000 tuns of lead in bullets during 1862.

NEW YORK MARKETS.

Bread.—Pilot, navy, and crackers, 4c. to 8c. per lb.
Candles.—Adamantine, sperm, and stearic, 19c. to 45c. per lb.
Coal.—Anthracite, nut, and egg size, $7 50 to $8 50 per 2,000 lbs.
Coffee.—St. Domingo and Java, 19c. to 38c. per lb.
Copper.—Sheathing and ingot, 30c. to 32c. per lb.
Cordage.—Manilla, American, and Russian, 15c. to 20c. per lb.
Cotton.—Ordinary, Middling fair, 74c. to 88c. per lb.
Domestic Goods.—Sheetings, 21c. to 36c. per yard; drills, 16c. to 40c.; shirtings, 23c. to 28½c.; stripes, 26c. to 47½c.; ticks, 25c. to 65c.; prints, 20c. to 23c.; ginghams, 21c. to 26c.; cotton flannels, 25c. to 40c.; cassimeres, $1 25 to $2 50; woolen flannels, 40c. to 60c; satinets, 50c. to 80c.; woolen cloth, $1 25 to $10; duck, American, $1.
Flax.—From 16c. to 18c. per lb.
Flour and Meal, $5 to $9 50 per barrel; rye, $5 to $5 50; corn, $4 40 to $5.
Grain.—Wheat, $1 13 to $1 75 per bushel; oats, 65c. to 73c.; corn, 88c. to 98c.
Gunpowder.—Blasting and rifle, 16c. to 28c. per lb.
Hemp.—American, $130 to $270 per tun.
Hops, 25c. to 27c. per lb.
Iron.—Scotch pig, $40 to $42 50 per tun; American, $38; Bar—Swedes, $125; English, $72 50 to $87 50; Sheet—Russia, 17c. to 18c. per lb.; English, 5½c. to 7c.
Lead.—English, $8 40 per 100 lbs.; pipe and sheet, 11c. per lb.
Leather.—Oak-tanned sole-leather, 38c. to 45c. per lb.; sole hemlock 25c. to 31½c. per lb.
Lumber.—Spruce board, $15 to $19 per 1,000 feet; white oak plank, $35 to $40; white oak staves, $50 to $135.
Molasses.—From 45c. to 62½c. per gallon.
Naval Stores.—Turpentine spirits, $2 75 to $2 80 per gallon; rosin, $37 to $41 per barrel of 280 lbs.
Oils.—Linseed, $1 35 per gallon; sperm, $1 47 to $1 70; crude petroleum, 34c. to 36c.; refined petroleum, 55c. to 65c.
Spelter, 8¼c. per lb.
Steel.—English, 20c. to 29c. per lb.; English spring, 8c. to 15c.; American spring, 6c. to 7c.; German, 10c. to 17c.; English blister, 12c. to 21c.; American blister, 5½c. to 6½c.
Sugar.—Brown, 11c. to 15c. per lb.; white, 15⅛c. to 16¼c.
Tea.—From 48c. to $1 40 per lb.—20 cents duty.
Tin.—Banca, 52c. per lb.; English, 44½c.; plates, $8 to $13 per box.
Tobacco.—Connecticut fillers and wrappers, 20c. to 45c. per lb.; Ohio fillers and wrappers, 15c. to 30c.; Cuba fillers and wrappers, 90c to $2.
Wool.—American Saxony fleece, 70c. to 72c. per lb.; Merino, 67c. to 69c.; California (unwashed), 25c. to 50c.

The trade sales of books which have just closed in New York, have been the most extensive that have taken place for a number of years. The book trade never has been better than during the present fall. All the book printing and binding establishments are working overtime.

The demand for spruce and pine lumber is good; while the supply is very limited.

The prices of sugar are very high, and the report is prevalent that this is not owing to any scarcity of supply, but the demands of large speculating holders, who control the market.

American pig-iron is scarce, and No. 1 brands rule at from $37 to $38 per tun.

Cotton has not been so high in price for fifty years, and it is gradually advancing with increased activity in the Manchester manufactories. The price of cotton goods advanced last week about 2 cents per yard.

Domestic silk manufactures are being rapidly developed; the tariff on foreign goods favoring their production. We heard recently that several new silk factories will soon go into operation in the vicinity of New York. Silk in pieces is now made at Cohoes, N. Y., but not on such a scale as at Hartford, Conn.

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COLORS AND THE FASHIONS.

Every spring and fall, labored descriptions appear in the daily papers of the "new fashions;" meaning thereby the style and colors of the new dresses, bonnets, &c., which the empress of fashion has prescribed to be worn for a few months, by the fair sex. So far as it relates to the cut of a cape, or frock, or the form of a bonnet, fashion may prescribe many forms without offending common sense; but fashionable colors are an absurdity. The laws of contrast in colors are immutable; therefore when fashion prescribes for a hat or its trimmings, or a dress, without taking the complexion of the wearer into consideration, taste and science may be equally violated. A clear blonde complexion may be rendered sallow to appearance by a mistaken color on a fashionable bonnet; and a comely brunette may be made to appear of a brick hue from the same mistaken ideas.

Colors of artificial flowers, bonnets and dresses, should always be selected with reference to complexion. M. Chevreul—the scientific French chemist—has devoted years of study to this subject, and has laid down the laws with precision, founded on the dogma—"That every color, when placed beside another color, is changed; appearing different from what it really is; and, moreover, it equally modifies the color with which it is in proximity." The following hints by Chevreul, for the toilettes of ladies, should be read and pondered by all who desire to cultivate harmony of colors and adorn their persons in the most scientific and pleasing manner:—

RED DRAPERY.—Rose red cannot be put in contact with the rosiest complexions without causing them to lose some of their freshness. Dark-red is less objectionable for certain complexions than rose-red because being higher than this latter, it tends to impart whiteness to them in consequence of contrast of tone.

GREEN DRAPERY.—A delicate green is, on the contrary, favorable to all fair complexions which are deficient in rose, and which may have more imparted to them without inconvenience. But it is not as favorable to complexions that are more red than rosy, nor to those that have a tint of orange mixed with brown, because the red they add to this tint will be of a brick-red hue. In the latter case, a dark-green will be less objectionable than a delicate green.

YELLOW DRAPERY.—Yellow imparts violet to a fair skin; and, in this view, it is less favorable than the delicate green. To those skins which are more yellow than orange, it imparts white; but this combination is very dull and heavy for a fair complexion. When the skin is tinted more with orange than yellow, we can make it roseate by neutralizing the yellow. It produces this effect upon the black-haired type, and it is thus that it suits brunettes.

VIOLET DRAPERIES.—Violet, the complementary of yellow, produces contrary effects: thus, it imparts greenish-yellow to fair complexions. It augments the yellow tint of yellow and orange skins. The little blue there may be in a complexion, it makes green. Violet, then, is one of the least favorable colors to the skin; at least when it is not sufficiently deep to whiten it by contrast of tone.

BLUE DRAPERY.—Blue imparts orange, which is susceptible of allying itself favorably to white and the light-flesh tints of fair complexions, which has already a more or less determined tint of this color. Blue is, then, suitable to most blondes; and, in this case, justifies its reputation. It will not suit brunettes, since they have already too much of orange.

ORANGE DRAPERY.—Orange is too brilliant to be elegant; it makes fair complexions blue, whitens those which have an orange tint, and gives a green hue to those of a yellow tint.

WHITE DRAPERY.—Drapery of a lusterless-white, such as cambric muslin, assorts well with a fresh complexion, of which it relieves the rose color; but it is unsuitable to complexions which have a disagreeable tint, because white always exalts all colors by raising their tone; consequently it is unsuitable to those skins which without having this disagreeable tint, very nearly approach it. Very light white draperies, such as muslin, plaited or point lace, have an entirely different aspect.

BLACK DRAPERY.—Black draperies, lowering the ones of the colors with which they are in juxtaposition, whiten the skin; but if the rosy parts are to a certain point distant from the drapery, it will follow that, although lowered in tone, they appear relatively to the white parts of the skin contiguous to this drapery, redder than if the contiguity to the black did not exist.

New Humid Process For Silvering Glass.

M. Adolphe Martin, Professor of Physics, at St. Aarbe, France, has described a new process of his for silvering glass without heat, and by means of sugar (*interverti*) which has been partially changed into glucose.

Amongst the various processes for silvering glass for optical purposes, and especially for the construction of telescopes, not refractors, but with glass silvered reflectors, is that of Mr. Drayton. This method, however, requires the utmost adroitness on the part of the operator, so that a new mode of greater simplicity was much required. Professor Martin says, after having experimented with all the previously known agents and methods of silvering—viz., with aldehyde; with sugar of milk; with glucosate of lime, &c.,—he has arrived at a process which gives all that can be desired, in facility of operation and firmness of adherence, and which gives a film of metallic silver whose physical constitution as deposited is such as ensures brilliancy and unchangeability.

The following is his method:—Four solutions are to be prepared. The first one of 10-grms. of nitrate of silver in 100-grms. of distilled water. The second, an aqueous solution of ammonia, standing at 13° of the areometer of Cartier. The third, a solution of 20-grms. of pure caustic soda in 500-grms. of distilled water. The fourth, into a solution of common white sugar, in 200-grms. of distilled water, there is to be poured one cubic centimetre of nitric acid at 36°. The mixed solution is then to be boiled for twenty minutes so as to produce interversion. There is then to be added 50 cubic centimetres of alcohol at 36° (Cartier?) and as much distilled water as will bring the whole volumes up to 500 cubic centimetres.

In addition to these solutions, the silvering liquid is to be prepared as follows: Into a flask holding about double the total bulk of 100 cubic centimetres, 12 cubic centimetres of the first solution (nitrate of silver), are to be poured with 8 cubic centimetres of the solution No. 2 (ammonia), and lastly 20 cubic centimetres of the solution No. 3 (caustic soda), with the addition of 60 cubic centimetres of distilled water.

If these proportions have been observed, the liquid remains perfectly limpid, and a single drop of the solution of nitrate of silver should produce a permanent precipitate in it. This solution is to be let repose for twenty-four hours, after which it is fit for use. Now as to its application. The surface of glass to be silvered must be cleaned scrupulously, and then passed over with a ball of cotton wet with a little nitric acid at 36° and finally washed with distilled water—drained from this and placed upon supports at the surface of a bath composed of the silvering liquid, as above, to which has been added from one-twelfth to one-tenth of its bulk of the interverted sugar, solution No. 4. Under the influence of diffused daylight, the surface to be silvered, immersed in the bath, is seen to become first yellow, then brown, and in about two to five minutes, according to the intensity of the chemical rays present, the silver will be found to have transferred itself uniformly over the whole surface of the glass.

In about ten minutes or a quarter of an hour, the coat will be found to have attained all the thickness desirable. The glass is then to be removed, washed by a gentle stream of common and afterwards of distilled water, and left to dry in free air upon a stand or horse.

The surface when dry presents a perfect metallic polish, covered as it were by a thin whitish veil.

By the application now of a very gentle rubbing with a chamois leather, slightly powdered with the finest rouge, this whiteness disappears, and a metallic reflecting surface is obtained of the utmost brilliancy, and whose state of metallic aggregation or "physical constitution" is such as renders it eminently suitable for the reception of optical images, and hence for instrumental uses.

So many and so diverse are the uses now to which silvered glass and porcelain may be put, both for scientific purposes and those of mere ornamentation, that it has seemed well to us to give to our readers this valuable process in complete detail.

Harbor Defense.

Mr. A. Watson of Washington, whose communication on harbor defense appeared on page 198, No. XIII., of the present volume, states that we have misapprehended his plans; that the gates oppose no area to the action of the tide, as they stand parallel with the channel, and not across it, and that the harbor is not blockaded, as the gates, chains, &c., lay flat on the bottom when lowered and do not obstruct the navigation in the least. Mr. Watson also suggests that iron be employed in place of wood for his gates, and with other modifications and explanations of his idea renders it more intelligible. The great weight of the chains and gates would require an immense force to raise them. We must defend the buoys against the statement that they will obstruct the channel five or six feet when lying on the bottom; they may be made parallelograms, or rectangular in shape, not thick, but of as large a superficial area as desired. The only reason we advocate buoys and chains is for their simplicity, cheapness, and apparent practicability; there may be cogent arguments against their adoption, but we cannot discover them, upon reflection, or from the objections as yet presented. A link of a chain made out of 3-inch round iron 5 feet long (which makes the link itself when welded about 2 feet in length) will weigh 120 pounds, calculated weight; one chain stretched across a channel 1 mile wide will therefore weigh upwards of 160 tuns, exclusive of slack or the necessary length to reach the bottom. The slack cannot be less than half the entire length, consequently 80 tuns must be added, which will bring the entire weight of one chain up to 240 tuns. In the model before us there are six chains and four gates, which of course makes 1,440 tuns for the chains. The gates we have estimated as follows: the conformation is that of a trapezoid having a base of 50 feet, a crown of 30 feet, and a neat depth (that of the channel in which it is sunk) of 30 feet. The area of this figure is 1,200 superficial feet. It is to be constructed of iron and we have allowed ¾ plate iron for the purpose. The inventor proposes 2-inch iron. A gate of the dimensions given must consist of two sides bolted or riveted together in the form of a box. The neat weight of these two sides exclusive of fastenings or end pieces is 2,400 superficial feet × by 35½ pounds; the weight of one square foot of ¾ iron, in all a little over 42½ tuns. Four such gates represent 170 tuns, without bottom pieces, sides, &c. The structure thus roughly computed will therefore weigh approximately over 2,000 tuns dead weight at the lowest. In view of this fact, and others mentioned, we do not think we are unreasonable in saying that the design is faulty and impracticable as now stated to us. Doubtless modifications may be introduced wherein this enormous weight may be compensated for, in which case there are good features in the general plan and conception.

Shaker Method of Making Soap.

As the time will soon be at hand when persons in the country will be making large quantities of sof' soap, the following method, practiced at the Shaker village, New Hampshire, may be useful to many:—

"Place a shallow iron kettle, to hold from 4 to 6 barrels, just out of the wash-room, under cover of a shed. Extend half or three-quarters inch pipe for steam to the middle of the bottom, bending it to form of surface, and terminating with open end. Take another pipe to discharge cold water over the top of the kettle. Use the best quality of 'first sorts' of potash, in the proportion of 6 pounds of potash to 7 pounds of grease, for a barrel of 40 gallons. Break up the potash into small lumps, and dissolve it in say 2 pails of hot water to 24 pounds. It dissolves rather slowly when the potash is good. When dissolved, put the solution into the kettle, add the grease quite warm, and stir the mixture together. Allow it to stand over night, if convenient. In the morning, apply a moderate jet of steam until the mixture appears ropy, or rather *soapy*. Shut off the steam and open the cold water valve, stirring the mixture, as the water runs, until the kettle is full, or the required quantity obtained for the materials used."

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MANUFACTURE OF ENGLISH FILES.

The *Ironmonger* (London) contains an account of a visit to Sheffield, and a description of the manufacture of files, at the steel and hardware works of Messrs. Peace, Ward, & Co. The establishment is extensive, there being no less than 500 persons employed in it; and the proprietors make their own steel, for files, saws, edge tools, table cutlery, &c. In our American file manufactories, the steel is not made on the premises as in Sheffield; but the files are made in the same manner, as most of our file manufacturers are Englishmen. The following is condensed from the *Ironmonger*, commencing with a description of the mode of making the steel for the files:—

According to the several sorts of files required to be made, different qualities of steel are mixed together, in certain definite proportions determined by weight; a certain amount of scrap, broken into small bits, is added; also a given quantity of manganese, and the whole taken to the melting house or foundery.

The furnaces are simply holes in the floor of the casting-room; they are about three feet deep, and hold two melting-pots or crucibles each. The melting-pots are made of fire-clay, molded into shape, and placed for twenty-four hours in a drying-oven, after which they are held to be thoroughly annealed. Each will hold 28½ pounds of blistered steel. Hard coke is the fuel used for the fires. After the furnaces have been raised to an intense heat, the crucibles, covered with lids, are lowered into them. In about three hours the steel is in a state of white fluidity. The workman, armed with huge iron pincers, steps forth to the mouth of the furnace-hole, and looking into the sea of white fire at his feet, firmly grasps the crucible, draws it out of the fire, and carries it to the cast-iron molds, which are placed on the floor of the casting-room at a short distance from the furnace. The lid being removed, the crucible is tilted, and the molten metal flows into the mold; a workman carefully watches the brilliant stream which shoots out magnificent sparks in every direction, and removes with an iron rod any dark spots he happens to discern in the mass. The molds into which the steel intended for the manufacture of files is poured are long and square. The ingots thus formed are allowed to cool, and the empty crucibles refilled with blistered steel for another casting. The cold ingots of cast-steel, for fine files, and the bars of blistered steel, for coarser files, are next taken to the rolling-mill and tilting-shop. Tilting consists simply in heating the steel to a white heat, and then hammering it with steam hammers into bars. After this, the steel in bars is heated in immense furnaces, then passed between rollers, and pressed into flat, square, round, or half-round strips, and afterward cut into suitable lengths, which are then ready to be forged into file-blanks. To each file-forge two men are allowed, excepting for the smaller sizes. One is a striker, the other a forger; the anvil contains a cutting chisel, and dies to give the proper forms to the blanks, which are forged to the exact size and form with tangs, then taken to the annealing furnace, where about one tun weight of them at a time are gradually heated to a bright red heat. All access of air is then excluded from the furnace, and two days are allowed for cooling. The annealed blanks which are now sufficiently soft to bend, are straightened by hammering, then sent to the grinding-shop, where they are reduced to the exact size, and their surfaces rendered bright and smooth, when they are ready to be cut.

The cutter, seated on a board, before a flat-faced anvil, holds a hammer in his right, and a chisel in his left hand, with his right foot in a leather strap or stirrup, to keep the file in its place upon the anvil. According to the size and nature of the article, the hammer varies in weight from one to six pounds: the chisel is held fast between the finger and thumb. In striking, the hollow of the left hand, which holds the chisel, is turned toward the workman. The tooth, or indent, is turned down from left to right, and the chisel always moved close to every preceding tooth, until the whole of the surface is covered with regular indentations. This first row of teeth is called the over-cut. When completed, the *fash* is filed off, and the workmen then proceed to up-cut the file at right angles across the over-cut, slipping up the chisel, as before. When one side of the file is finished, the workman proceeds to cut the other side in the same manner. However, as direct contact of the cut side with the bare face of the anvil would be sure to spoil the entire cut, a flat piece made of an alloy of lead and tin is interposed between the toothed surface and the anvil.

The double cut must form most perfectly regular diamond teeth; the cutter must always know, not only how to adapt the strength of his blow to the nature of the steel he is operating on, but also how to regulate the fall of his chisel in harder and softer parts of the same file, so as to insure perfect uniformity and regularity of the teeth throughout. File-cutting machines have been introduced into Manchester; but although the teeth of the files are fully more regular than those cut by hand, they are said to want that peculiar angular burr that is produced by hand. When the files are cut, they are next hardened; the process of which is thus described:—

"The old system, which is still pursued in many file factories, but has been superseded by an entirely new method, consisted of brushing the files over with ale-ground and salts; drying them on an iron rack placed near the fire; then taking them up one by one with the tongs, held by the right hand—placing them on fires of very small coke,—blowing the bellows, held by the left hand, and heating to cherry redness, beginning at the heel, then moving the file about in the fire until it looked cherry red from the tang to the point; they were then set or straightened with a wood or lead hammer, and after this dipped into a cistern filled with brine. The new method which is pursued, is to cover the files over with a certain composition (a secret of the firm), which gradually dries on them; then to heat them to redness in a metallic bath, and dip them afterwards in brine. The tempering achieved by this new method is very superior to that of the old process, besides affording a considerable saving of time and labor. The files, which before the tempering were almost as soft as lead, are now quite hard."

The tempered files require thorough cleaning, which is effected with brushes and sand in water-tanks. After this operation, they are placed for twenty-four hours in a lime-bath, which serves, as it is technically termed, to *kill* the salt.

The files taken out of the lime-bath are dried, and after this oiled and brushed. The tangs are now put into a metallic bath to soften them, in order to prevent their breaking.

Every file is carefully examined and tested by the manager. First, a powerful magnifying-glass is used, to ascertain whether the teeth are quite regular throughout; then the file is rung on a large metal plate, and if it does not sound clear, it is rejected as *imperfect*. It is finally tried with the sharp edge of a prover, made of hard hammered cast-steel. After examination and approval, the files are handed to girls, who brush them over, and wrap them in paper parcels.

We gave a full description of the mode of manufacturing files in America, on page 22, Vol. XIV Scientific American (old series), which is more minute in some particulars than the above. For example, the composition for coating the files preparatory to tempering, is given, and the mode of using the lead bath for heating is the same which is said to be a new process in England. Our American file manufacturers may find it to their pecuniary advantage to adopt the Sheffield system, of making their own steel.

THE BEARD.

Nature has supplied the most of mankind with beards, and in very ancient times, the use of a razor upon it was unknown. In Greece, the first instance of shaving occurred in the reign of Alexander the Great. This warrior ordered the Macedonians to be shaved, lest the beards of his soldiers should afford handles to their enemies. The sarcastic Diogenes, when he once saw some one whose chin was smooth, said, "I am afraid you think you have great ground to accuse nature, for having made you a man and not a woman." In Cicero's time, the genuine beard was not worn by society. But the *barbula* (goatee) seems to have been affected by the young Roman "swells."

The beard began to revive again in the time of the Emperor Hadrian. But of all the emperors who wore that ornament, none creates so much interest in posterity as the Emperor Julian. His beard is the most famous beard in history. Speaking of it, he says:—"I commence with my countenance. It had nothing regular, or particularly agreeable about it; and out of humor and whimsicality, and just to punish it for not being handsome, I have made it ugly by carrying this long *and peopled beard*."

The Britons, like the ancient Gauls, allowed the hair to grow thick on the head; and, although they shaved their beards close on the chin, wore immense tangled mustaches, which sometimes reached to their breasts.

It may be presumed that the Northern nations felt the symbolic force of these appendages; we have a well-known passage in Tacitus about the Catti, who, he says, made a general custom of what among other German people was an affair of private daring—the letting the "crinem barbamque" grow till they had killed an enemy. The Normans, when they conquered England, were well shaven, on the back of the head as on the face: but the Saxons wore full beards.

In Edward II.'s reign, beards were worn apparently by persons in years, great officers of State, and knights templars, but not generally. Sir John Mandeville, the traveller (who died A. D. 1372), was called Sir John with the Beard (presumably from its size). In Edward III.'s time—the heyday of chivalry, of feudal ornament, of love-poetry, of heraldry—long beard and fine mustache were in honorable estimation. In Richard II.'s reign, the fashion continued. The beard was "forked," and "in all knightly effigies the mustache is long and drooping on each side of the mouth."

A sober and well-governed gentleman of Elizabeth's time, regulated his beard, as he did his dress, mind, manners, or conduct. It was an index of his status or profession; an emblem of his feelings and tastes—a symbol to be respected like his coat of arms. The Reformer, John Knox, cherished a large and profuse one, obviously from its patriarchal character, from the honor shown it in the Jewish days, from whose sentiment he drew his inspiration. The scholar, such as George Buchanan, wore it—sometimes as one who followed Knox and Calvin.

The hair, as we all know, played an important symbolic part in the Civil Wars of England; and the same rigor which the Puritan exercised on his head, he exercised on his chin, and trimmed his beard as closely as he trimmed his locks. The Vandyke beard is the typical one of this period. Peaked beards and mustaches were popular among the cavaliers; and were at least pretty generally worn.

Beards went out of fashion for more than two hundred years, among the Anglo-Saxons of Europe and America; but they have been revived again, and they are now cultivated and defended upon scientific considerations.

The mustache is approved because it is said to be a natural respirator; a defense to the lungs against the inhalation of dust; and the beard is defended as a protection for the throat against cold. It has been recommended that all preachers who are subject to throat diseases should allow their beards to grow. Travellers in sandy regions, millers, bakers, and all mechanics, should allow the beard free play.

A Nation of Pigmies.

In the Bay of Bengal, on the very high road of commerce, is a group of islands thickly covered with impenetrable jungle, and swarming with leeches in the rainy, and ticks in the dry season. Except a species of pig, until recently unknown to science, there are no wild animals that offer any molestation to man; but to make up for this deficiency, the human inhabitants are amongst the most savage and hostile that voyagers have ever encountered. They may truly be termed a nation of pigmies, being on an average only four feet five inches high, and weighing from seventy to seventy-five pounds; but they are well-proportioned, and display an agility and nimbleness truly wonderful. Their skin is dark, though not black as that of the negro, and their faces decidedly ugly. They go entirely naked, shave the hair off their head with pieces of bamboo or broken bottle, and further increase their unsightly appearance by daubing themselves all over with a mixture of red ochre and oil; or covering their persons towards nightfall with a thick coating of soft mud, to serve as a protection against the mosqui-

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toes, with which, in addition to the leeches and ticks, they seem to be tormented the whole year round. They are excellent swimmers, taking to the water almost before they can walk ; and they rely upon the sea for the principal supply of their food—turtles, oysters, and fish.

Correspondence

American Guns.

MESSRS. EDITORS :—In an editorial article in your last issue, under the caption of "American guns," you quote from the Pittsburgh *Chronicle* an item in reference to the 15-inch guns, containing a grave misstatement and a very absurb suggestion. The 15-inch guns have *not* been condemned by the Department, as failing to realize the results anticipated from their use ; and the statement is founded on the most unreliable of sources—a Washington rumor. Some modification of the model is being made, but this would seem to prove that the guns have, in the main, proved satisfactory. In order to admit of their use in the monitor turrets, the first guns were made much shorter than the sea-coast 15-inch ; those hereafter made will be at least eighteen inches longer than those now in the turrets, and will be reduced at the muzzle to an exterior diameter of about twenty-one inches—three inches of metal, only. Such of the short guns as had not been forwarded have been turned down at the muzzle to conform to this modification, and one has been severely tested in Washington, proving that it has not been weakened by the reduction of the muzzle. I presume it is generally known that the monitor ports will be slightly enlarged, and the muzzles of the guns protruded, hereafter, in firing. These facts do not seem to indicate any design on the part of the Government to abandon the new 15-inch guns.

The brilliancy of proposing to increase the efficiency of a gun, objected to on the score of being already too weak, by rifling it, needs no comment. It is sufficiently striking and must commend itself to the Department. PITT.

Pittsburgh, Pa., Oct. 6, 1863.

Gas from Petroleum Tar and Hard Wood.

MESSRS. EDITORS :—It is generally supposed that the gas oils and residuum or tar distilled from petroleum are not adapted to gas making. To correct this impression I send you the following statement. The Aubin Gas Works are now arranged to make gas from the above tar and hard wood. From 40 gallons of the one and 1,800 lbs. of the other, they make (in ordinary operations as now used by many village gas companies), 12,000 feet of rich gas. Much of this great yield of course, comes from the wood ; but as the charcoal is worth what the wood costs, the entire yield is justly claimed from the tar. When I add that so exhaustive a process prevents clogging of either pipes or retorts, it is evident that whatever may be the objections to the use of petroleum and its distillates in coal and rosin gas-works, they apply to the works and not to the oils ; which when treated according to their conditions, are the richest and cheapest gas-making materials known.

H. Q. HAWLEY.

Albany, N. Y., Oct. 2, 1863.

How to Conquer Belligerent Bees.

A correspondent sends us the following remedy for pugnacious bees. It would seem to be effective :—

MESSRS. EDITORS :—In your issue of 26th September you copy an extract from the *American Stock Journal*, entitled "Bees," giving a remedy to stop them from robbing each other of their honey, all of which may be very good, in the absence of a better method. But having positive knowledge of a much quicker and simpler plan, I beg to lay it before your readers :—

When it is discovered that two swarms of bees are at war with each other, by turning up the hive containing the attacking bees, thrusting a stick up into the honey, and fracturing the comb, you will at once stop all further aggression, and set the bees repairing the damage done to their own empire, instead of trying to conquer another. G. B. TURRELL.

INVENTIONS AND DISCOVERIES ABROAD.

Purifying Gas With Animal Charcoal.—The following interesting extracts are from a communication to the *Journal of Gas Lighting* (London), by George Smedley, of the Sleaford Gas Works. He says :—"Being engaged (with the assistance of another person) in manufacturing manures from the refuse of the works, we made use of animal carbon as a vehicle, and, on one occasion I had some gas-liquor filtered through a small quantity of the same, when I discovered that, after filtration, the liquor was deprived of nearly the whole of its ammonia. I repeated the operation several times, and each time obtained the same result. Then came the thought—I have neither scrubber nor washer ; here is a material that has an affinity for ammonia in a liquid form ; why not in a gaseous one? Try it. I did so, by filling one tray in each purifier with the carbon. On the following days I applied the turmeric test ; and lo ! the old nuisance had vanished. I afterward made a small purifier, charged it with carbon, and, on testing the gas with the crude apparatus at my disposal, discovered it had the power of intercepting sulphuretted hydrogen as well as ammonia, but only a small per centage of carbonic acid. Further, I believe gas purified by animal carbon, retains a greater per centage of hydrocarbons than by either lime or oxide of iron. I must confess to you that I have not the means of satisfying myself on these points ; and shall only be too glad if any one in the gas world would solve these questions for me. My only idea at present is that it may be useful on small works where no means are provided of getting rid of the ammonia, by using it for that purpose, and afterward disposing of it at a profit. As the great question with us all is to have our gas as pure as possible, at the smallest cost, I submit this to you with the view that some one may take it up."

Transferring Photographic Pictures to Porcelain and Glass.—The *Photographic News* contains an interesting article on this subject, the inventor of the process being M. Grume, chemist, in Berlin, Prussia. The mode of conducting the operations is described as follows :—"The paper (resembling ordinary albumenized) is silvered as usual, but very much over-printed from the negative ; in fact, till the lights are quite gone, and the print appears lost. It is then washed, to free it from silver, and toned, and then rinsed. While rinsing, the print may be observed to be covered with blisters. These gradually increase in size until finally the delicate film of gelatine upon which the picture is splits off and floats into the water. It is then very carefully placed in hypo-sulphate of soda and then well washed—every washing appearing to render it more tough, till at last it may be handled with impunity. The glass, or porcelain, upon which it is to be placed is then passed under the film, and both lifted out of the water together. When dry it is trimmed and covered with transparent hard varnish. We have also received from Messrs. Harvey, Reynolds, & Fowler, a sample of paper for producing these pictures. The instructions they forward contain one or two additional hints. Excite the paper as for albumenized paper. Dry. Print *very* deeply, you can scarcely print too deep. Tone as albumenized paper ; more care will be required as the prints are over-printed, and the changes of tone are not so readily observed. Wash in water. A film now begins to leave the paper. Pass into the hypo-bath one part in five. The film now entirely separates from the paper, and the paper must be removed. Let the film remain in the hypo about ten minutes, and then carefully and thoroughly wash in water. The film is now very elastic. To transfer this film to any surface, clean the surface, and bring it under the film which is floating on pure water. Raise both out of the water together, pull the film into the desired position on the object, and let it dry. Then varnish with a clear varnish. If the film should not adhere as closely as desired on round surfaces, wash it (without removing it from the object) with a mixture of 1 part acetic acid 32°, and 6 of water. As soon as it becomes elastic, wash with water, and it will adhere well. As the manipulations thus described seem to present some difficulties, we were anxious, prior to bringing the process before our readers, to put it into practice. We have accordingly exposed half-a-dozen pictures and transferred them according to instructions. We have succeeded beyond our expectations, and have obtained, at the first attempt, some very pleasing transfers. The paper was excited on a sixty-grain bath, and a couple of pieces exposed under a portrait negative, until the highest lights were of a lavender tint. This we subsequently found was not quite deep enough. The prints were washed and toned as usual, reaching a deep purple in the gold bath, which was one made after Parkinson's formula. On being transferred to a dish of water, and washed well, we did not observe either blistering or entire separation of the film as expected. We then transferred them to the hypo bath, and allowed them to remain a quarter of an hour. A slight blistering was now apparent, which increased in the subsequent wash of water. But as the separation did not take place so speedily as we anticipated it, we added a trace of carbonate of soda to the water, and in a few minutes we saw the delicate transparent film separated from the paper, and floating in the water. After rinsing, we placed a piece of white enamel glass underneath the floating film, and by a little careful management lifted it from the water uninjured, and stretched flat upon the glass, where it dried, smooth, bright, and firm. We now exposed a couple more, and printed until the image was completely buried ; after which, before toning, we trimmed the print to the shape we desired, as we found it was a difficult thing to shape the film when once detached from the paper. We toned this time in a bath containing a little carbonate of soda, and we observed in the subsequent rinsing that the blisters began to rise ; these increased in the hypo bath, and in the course of the subsequent washings, the film readily separated and floated away from the paper. A subsequent couple were toned in the lime bath, washed, and fixed. These also separated in the subsequent washing without any trouble ; but a longer time was necessary, some hours elapsing before the film of albumen was quite detached. The attenuated film, as delicate as the wing of the smallest fly, at first sight seems quite unmanageable, curling, twisting, and folding itself with the slightest disturbance of the water ; and if the object on which it is to be placed be brought under it, and both lifted out of the water without proper precaution, it will probably be found to have run up together into a shapeless mass, apparently beyond remedy. If it be carefully returned to the water, the probability is that it will gradually float straight out again, and present itself quite uninjured. A little care and patience will be required. The variety of ornamental purposes for such transfers will readily suggest themselves. When transferred to plain white enamel glass, the pictures acquire not only a beauty as transparencies, but also as positives, which they did not possess before. The pure white and fine surface seems to impart a wondrous charm of delicacy and brilliancy altogether unexpected, which, for locket and brooch portraits, will possess especial value. It is probable that the film so transferred to ivory will be of value to the miniature painter. As ornaments for vases of opal glass, &c., many very beautiful effects may be produced. In the art of diaphanie, and as an adjunct to the now fashionable art of decalcomanie, it will probably be found useful ; and in a variety of ways which do not now occur to us. At present, the only protection is a hard varnish, but it is possible that by the use of an enamel powder fusing at a low temperature, a vitreous surface might be secured."

Paint for Coal Tar Colors.—A patent has been granted to B. Dupy and Antoine Vibert, of Lyons, France, for making pigments to be employed in oil painting from the colors of coal tar, which have hitherto been chiefly used for dyeing silk and woolen fabrics. For obtaining cakes of red, blue, and violet, 15 grammes of white soap are used, dissolved in 100 grammes of hot water, and there is then mixed with the solution 6 decigrammes of color, previously dissolved in methylitic alcohol, or other solvent. To this mixture is added 25 grammes of alumina, in a gelatinous state, and the mixture is then filtered and dried. These proportions may be varied at discretion ; for, instead of 6 decigrammes of color, a larger quantity may be used, in order to have a greater depth of color. Instead of white soap, glycerine and soaps made from oils or grease derived from animal matters may be employed ; and, instead of alumina, sulphate of barytes or other metallic or earthy oxide

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may be used; and in this way, all the colors derived from tar may be manufactured into pigments. Thus the color is dissolved in any of the known solvents, and then mixed in water both with vegetable or animal soaps, dissolved in the hot or cold state, and the colors precipitated by alumina, previously precipitated from alum, or sulphate of barytes, or any kind of salt or metallic or earthy oxide. By these means, and especially by the assistance of an animal matter in a soapy state, the colors are rendered solid and durable, and are applicable for painting. A fine yellow cake or product is obtained by employing picric acid in combination with an earthy compound and the picrates in general, particularly the picrate of lead. These aniline colors are mixed with animal or vegetable soaps for making the colors soluble in water. When the blue and yellow products are combined, a fine green is obtained, and the mixture of red and yellow produces an orange color; and, by the mixture of the different colors, all varieties of tints can be procured. The richness of these colors is unequalled; and, as they maintain their tints when exposed to light, they are invaluable in the arts.

[A gramme is equal to 15 44 English grains; and a decigramme 5 65 dr. avoirdupois.

SCIENTIFIC INFORMATION---BRITISH ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

In a recent issue we gave some condensed extracts from the opening address of the Chairman of this Association—Sir William Armstrong—and now present condensed abstracts of practical papers read by the members. We have done this every year, because many of the papers read are of a very useful character; there being a large number of mechanics and engineers members of the Association.

Gun Cotton.—Dr. Gladstone, member of a committee appointed to investigate this subject, read a paper relating to the chemistry of gun cotton. He stated that the Austrian gun cotton exhibited a marked degree of superiority over all other kinds. Among its advantages were, that it did not become ignited till it was raised to a temperature of 136° centigrade, that a gun was less injured by repeated discharges from it by gun cotton than by gunpowder, that gun cotton was not injured by damp like gunpowder, that no smoke arose from the explosion of the gun cotton, and that there was no residuum left in the gun to be got rid of before another charge could be introduced.

Mr. J. Scott Russell read a report on gun cotton from the mechanical section. He stated that the committee found it difficult to believe that greater mechanical effect could be produced by gases generated from gunpowder. It seemed to the committee that gases once generated under a given pressure, expanded under the same law, must produce in the same chamber or shell effects nearly identical; and it was only after long and careful examination that they were able to understand and reconcile themselves to the fact that greater mechanical effects were produced by the gases of gun cotton than by the gases of gunpowder. One hundred pounds of gun cotton produced, when exploded, 955 cubic feet of gas, while the same weight of gunpowder produced 308 feet of gas when exploded. As regarded bulk, 22 pounds of gun cotton go into one cubic foot, while from 56 to 60 pounds of gunpowder go into one cubic foot. The great waste of force in gunpowder constituted an important difference between it and the gun cotton, in which there was no waste. Gunpowder consisted of about 68 per cent solid matter and 32 per cent useful gases. It might be said, therefore, that one-third of the gunpowder was not directly useful in producing gases; but the 68 per cent of solid matter in gunpowder was not only waste itself, but it used up a large portion of the mechanical force in the remaining 32 per cent of useful gases. Gun cotton can be exploded in any quantity instantaneously. This was once considered its great fault, but it was only a fault when we were ignorant of the means to make that velocity anything we pleased. General Lenk has discovered the means of giving gun cotton any velocity of explosion that is required, by merely the mechanical arrangements under which it is used. Gun cotton, in his hands, has any speed of explosion, from 1 foot per second to 40 feet per second, which is the velocity of gunpowder. The instantaneous explosion of a large quantity of gun cotton is made use of when it is required to produce destructive effects on the surrounding material. The slow combustion is made use of when it is required to produce manageable power, as in the case of gunnery. The temperature of ignition of gun cotton is between 277° and 338° Fah. One pound of gun cotton produces an effect exceeding three pounds of gunpowder, in artillery. It may be placed in store, and preserved with great safety. Danger from explosion does not arise until it is confined. It may become damp, and even perfectly wet, without injury, and may be dried by mere exposure to the air. This is of great value in ships of war and in case of fire the magazine may be submerged without injury. Gun cotton keeps the gun clean, and therefore performs much better in continuous firing. In gunpowder there is 68 per cent of refuse, while in gun cotton there is no residuum, and therefore no fouling. Experiments made by the Austrian Committee proved that 100 rounds could be fired with gun cotton against 30 rounds of gunpowder. Experiments showed that 100 rounds were fired with a 6-pounder in 34 minutes, and the temperature was raised by gun cotton to only 122° Fah; while 100 rounds with gunpowder took 100 minutes, and raised the temperature to such a degree that water was instantly evaporated. The firing with the gunpowder was therefore discontinued; but the rapid firing with the gun cotton was continued up to 100 rounds without any inconvenience. The absence of fouling allows all the mechanism of a gun to have much more exactness than where allowance is made for fouling. The comparative advantages of gun cotton and gunpowder for producing high velocities are shown in the following experiment with a Krupp's cast-steel gun, 6 pounder:—Ordinary charge, 30 ounces of powder, produced 1,338 feet per second; charge of 13½ ounces of gun cotton produced 1,563 feet. The fact of the recoil being less in the ratio of two to three enables a less weight of gun to be employed, as well as a shorter gun. The fact that the action of gun cotton is violent and rapid in exact proportion to the resistance it encounters tells us the secret of the far higher efficiency of gun cotton in mining than gunpowder. The stronger the rock the less gun cotton comparatively with gunpowder is found necessary for the effect—so much so that while gun cotton is stronger than gunpowder, weight for weight, as three to one in artillery, it is stronger in the proportion of 6·274 to 1 in strong and solid rock, weight for weight. It is the hollow rope form which is used for blasting. Its power in splitting up the material is regulated exactly as you wish. It is a well-known fact that a bag of gunpowder nailed on the gates of a city will blow them open. A bag of gun cotton exploded in the same way produces no effect. To blow up the gates of a city with gun cotton it must be confined before explosion. Against the palisade of a fortification a small square box containing 25 pounds simply flung down close to it will open a passage for troops. In actual experience on palisades a foot in diameter and 8 feet high, piled on the ground, backed by a second row of 8 inches diameter, a box of 25 pounds cut a clean opening 9 feet wide. To this three times the weight of gunpowder produced no effect whatever, except to blacken the piles. A strong bridge of 22-inch oak, 24 feet span, was shattered to atoms by a small box containing 25 pounds of gun cotton laid on its center. The bridge was not broken; it was shivered. Two tiers of piles were placed in water 13 feet deep, 10 inches wide, with stones between them, and a barrel of 100 pounds of gun cotton placed 3 feet from the face, and 8 feet under water, made a clean sweep through a radius of 15 feet, and raised the water 200 feet. In Venice a barrel of 400 pounds of gun cotton, placed near a slope, in 10 feet of water, at 18 feet distance, threw it in atoms to a hight of 400 feet.

Captain Galton, R E., said the subject reported upon was exceedingly important, but it must be borne in mind, in connection with the subject, that the Austrians had within a recent period discontinued the use of this material for guns. He begged to suggest that a proposal be submitted to the committee to the effect that it be requested to continue its labors in this inquiry.

Iron Ship Building.—A paper was read upon this subject by C. M. Palmer, of the "Jarrow Works," near Newcastle—a most extensive establishment, where iron steamships are built complete, with all their machinery produced from iron manufactured on the premises. He said:—

"The principal advantages claimed for ships of iron, as compared with vessels of timber, are briefly these:—In vessels of 1,000 tuns the iron ship will weigh 35 per cent less than the timber vessel, the displacement of water being the same. The iron ship will, therefore, carry more weight, and as the sides are only about one-half of the thickness, there will, consequently, be more space for cargo. The additional strength obtainable, too, allows iron ships to be built much longer and with finer lines; thus insuring higher sailing or steaming qualities, with greater carrying power. In wooden vessels repairs are frequently required, while the repairs in iron ships are generally of a lighter character, and are only needed at long intervals. An iron ship is not liable to strain in a heavy sea, whereas the straining of a timber vessel often damages a valuable cargo. Moreover, the use of iron masts, steelyards and wire rigging, effects a very large saving of weight, and affords the greatest facilities for the application of patent reefing sails, and other appliances by which economy of labor is attained. As to the form of building iron ships, and the manner of combining the iron, so as to obtain the requisite amount of strength with the least amount of material, much difference of opinion exists among practical men. The angle iron frame and plating of the iron vessel take respectively the places of the timbers and planking of the wooden ship: and it has been found by experience that plating one-eighth of an inch thick is equivalent in effect to planking of oak one inch thick, while plating $\frac{11}{16}$ths of an inch thick is equal to planking of oak five inches thick. As in the largest American wooden vessels the plank is seldom more than five inches thick, so it may be argued on the above data that the plating of the largest iron ship need not be more than $\frac{11}{16}$ths thick; and any strength required above that which such plating would give should be obtained by framework. Many practical men, however, advocate the system of light framework, and (in order to obtain the measure of strength necessary), the application of thicker plates. That the principle of strong framing and plating of moderate thickness is most advantageous may be shown by many facts. The strength of an iron ship, as in a girder, depends on its capability to resist the buckling and tensile strains that it is called on to bear. We have only to make a ship strong enough to resist the buckling strain. We have to make the parts of an iron ship, in principle, like a girder. A girder, however, is at rest, and the strains are always in some known direction; but in a ship, the position of which is ever varying, it requires to be so conducted as to resist the strains in such varied positions. If the side of a ship could remain as in a girder, constantly vertical, then the advocates for the thick plates and small frames might be able to show that their system was the most economical way to obtain the requisite strength; but, as such side, if laid over, as it is in a ship at sea, would, without support, bend or buckle of its own weight, it is evident that the framing is absolutely necessary to keep the plating firm in position, and consequently the strength of the ship depends in a very great degree on the strength of the framing. Another fact that shows the economy of strong frames is, that a plate with a piece of angle-iron attached to its edge, would bear much more before buckling than a similar plate increased in thickness so as to weigh the same as the plate and angle-iron.

Deepest Coal Mine in the World.—The coal mine of Monkwearmouth was visited by a party of members of the British Association, among whom were four ladies. The depth of this mine from the surface is 1900 feet, and the workings of coal underneath extend to a distance of two miles from the shaft. About 300 persons are employed in it, and 600 tuns are mined daily. The heat at the bottom varies from 84° to 90° Fah., and the miners work in an almost nude state. Of all the pursuits by which men gain a living, there is none more toilsome, more dangerous, or more dreadful in all its circumstances and surroundings, than the life of him who wins coal from the mines.

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Improved Hose Pipe.

In very many conflagrations the origin of the disaster is confined to a very small and sometimes inaccessible place, as under the eaves of houses, in the holds of ships, between party walls, &c. Were it possible, in all cases, to direct a stream to the precise spot, much valuable property would be saved that is now lost. In general this cannot be done without cutting away walls, floors, or other parts of the building. Herewith is illustrated a hose pipe on an entirely new plan; it admits of turning a stream of water in any direction, while the hole through which the pipe is inserted need be no larger in diameter than a hat or an ordinary pane of glass. Upon inspecting the engraving it will be seen that there are two nozzles, A and B, on the butt, C; these nozzles are furnished with water-tight joints, D, which stand obliquely with the body of the butt. When these nozzles are turned (they revolve easily on their seats at the joints, D) the water passage is, of course, changed, and the stream follows the direction to which the nozzle is moved; in Fig. 2 we have illustrated this peculiarity, and it will be fully understood by referring thereto.

Another feature is provided in this hose pipe whereby the nozzles are rotated by the action of the issuing jet, and the same made to cover a larger area of surface than when simply thrown straight ahead. This is done by making an easy working bearing at E, by which both the nozzles and the jets issuing from them revolve rapidly when they are turned, as shown in Fig. 2. This revolution is caused by the stream impinging or striking against the air, and by its sudden divergence from a straight line; which causes its force to be transferred to the side of the curved nozzle and the same turned on the axis, E. These passages and nozzles can be set at any required curve, by simply turning the branch on which both of them are set and tightening the thumb-screw, F; or they can be as rapidly changed to throw revolving jets by the same agency: viz., the slacking of the screw just named. All firemen and others interested will readily see how many changes it is possible to make: the revolutions of the nozzle can be instantly checked by grasping the axis or bearing, E, so that the water may be continued on any desired point; in short, the changes are endless and combine a wide range of usefulness. The main nozzle throws as straight a stream as any other pipe, unless turned on one side, as in Fig 2; and all the passages in whatever position are easy curves and not abrupt angles. This invention has been patented in this country and in England, France and Belgium, through the Scientific American Patent Agency; the American patents bearing date Oct. 14, 1862, and 1863. Those wishing to purchase State, city or village rights, or nozzles, can address the proprietor, C. H. Morrison, LeRoy, Genesee Co., N. Y., or his attorney, H. B. Morrison, traveling agent, LeRoy, N. Y.

Fig. 1

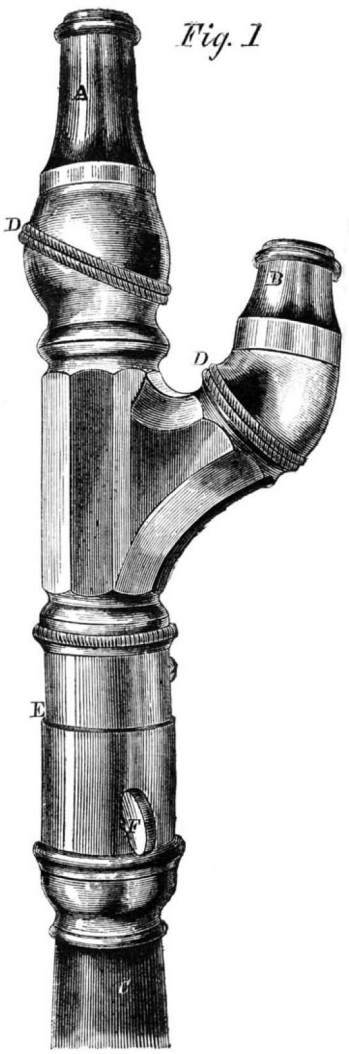
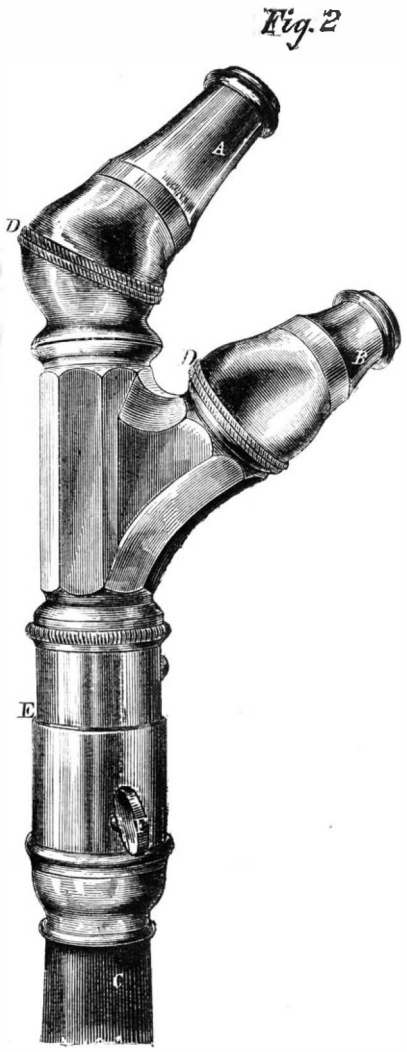


Fig. 2



MORRISON'S IMPROVED HOSE

HARBOR DEFENSES.

We have recently received quite a number of communications on the above subject, in which different plans are proposed and described. Some of these are very good, while others are entirely inapplicable under the circumstances. But one correspondent asserts that it makes no matter how good a plan may be devised for such a purpose, neither Government officials nor city committees appointed to look after harbor defenses, take the time or the trouble to give inventors a fair hearing. He asserts that the neglect and indifference of persons in authority to suggestions for the benefit of the country, coming from persons outside of the military and navy departments, are notorious, and the action of State and city commissioners forms no exception to this charge. The charge is undoubtedly founded on personal experience, and it is to be regretted that such a state of indifference to the suggestions and plans of many ingenious men should exist. The New York Chamber of Commerce, as a body, appears to have come to the conclusion that the harbor is nearly in a perfect state of defense, and that in a short period no hostile fleet will be able to enter it. At its regular meeting, held on the 1st inst., Captain Marshall stated that the work of fortifying the harbor was rapidly progressing, and even at the present moment the defense was ample. It was asserted that a hostile fleet coming up would have to encounter the fire of 800 guns of the heaviest caliber. No wooden vessel could sustain this, nor any iron-clad at a short range. Very soon all question as to the impregnability of the harbor will be set at rest by the completion of the defences.

California Champagne.

The success of the experiment of manufacturing champagne in California is now an established fact, and the production of that generous beverage in our State hereafter will undoubtedly be so great as to enable us to drive the poisonous European simulated brands from the American market, lay "Jersey lightning" on the shelf, and compete successfully with the manufacturers of the most celebrated European brands for the trade of the world. About 15,000 bottles have already been put up at the Haraszthy Vineyard at Sonoma, this season, and about 600 bottles per diem are now being turned out. This wine will commence ripening fit for market in October. One thousand dozen of this wine has already been ordered by a French house in New York, to be shipped next month via. Cape Horn. Thirty thousand gallons of still wines of the same growth will be shipped by the same vessel. The vintage in both the northern and southern grape-producing districts of California will be larger than ever before, more vines coming into bearing, and the crop in all the vineyards, so far as we can learn, being more than an average one. The drouth which so injuriously affected all the other crops in Los Angelos and San Bernardino counties, appears to have had little or no deleterious effect on the grapes.

[The *Californian* has omitted to state one important point—whether it is "sold at a price within the reach of all."—EDS.

Artificial Marble.

Sir James Hall upon one occasion produced crystalline marble by subjecting chalk to a high heat in a close vessel. Professor Rose of Berlin, Prussia, tried the experiment, and failing to produce such a result denied the correctness of Sir James Hall's statements. Being assured that crystalline marble had thus been produced, and that the specimens could be seen in London, he entered upon a second experiment, and in a recent communication to the Berlin Academy of Sciences, Professor Rose states that marble can be produced by exposing massive carbonate of lime to a high temperature under great pressure. His experiments were made with aragonite from Bilin in Bohemia, and with lithographic limestone. In one case the mineral was heated in a wrought-iron cylinder, and in the other in a porcelain bottle, the vessels being air-tight. They were exposed to a white heat for half an hour, and on cooling, both the aragonite and the lithographic limestone were found converted into crystalline limestone; the former resembling Carrara marble, and the latter a grey granular limestone. The change was effected without any material decomposition; the resulting marble containing a trifle less carbonic acid than lithographic limestone, from which it was produced.

The Armstrong Gun Useless.

The London *Army and Navy Gazette* of Sept. 12, regrets to state that in the late experiments with the Armstrong guns at Newhaven the defects of the lead-coated shot and fine grooving were very apparent, as happened in the previous practice. With the full charge of twelve pounds, several of the shells burst at the muzzle, and one in the gun, cutting up the grooving; while others of the shells were stripped of their lead coating and fell short. Last Thursday's experiments, which were conducted partly to try the fuses, showed that the one hundred and ten-pounder could not be depended upon in the hour of greatest need in a close hand-to-hand combat, and established also the fact that the peculiar nature of the Armstrong rifling rendered it very difficult, if not impossible, to obtain a safe fuse for the gun.

SEWING MACHINES.—A few weeks ago in noticing the articles of most interest in the Fair of the American Institute, it was stated that Messrs. Grover & Baker's sewing machines were on exhibition. We have since been informed that none of the machines of this company, but specimens of the work executed by them, were exhibited on that occasion. The Grover & Baker machines and their work have been exhibited in competition with other machines at the State Fair's of Vermont, New York, Iowa, Michigan, Kentucky, Indiana and Illinois, during the past month, at each of which they have taken the highest premiums, both for the machines and work.

THE Michigan Central Railroad Company is about to erect a very extensive grain elevator at Detroit. Its dimensions will be one hundred and ninety-three feet four inches in length, by seventy-seven feet six inches in width. The hight to the summit of the cupola will be one hundred and twenty-eight feet. The bins will be eighty in number, with a depth of fifty-five feet each.

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VOL. IX, NO. 16...[NEW SERIES.].....*Nineteenth Year*

NEW YORK, SATURDAY, OCTOBER 17, 1863.

ECONOMY OF FUEL.

There is much homely truth in the old proverb—"economy is wealth." A saving effected in the consumption of any article, such as fuel, with the attainment of equally favorable results, amounts to an increase of wealth in proportion to the value of fuel economized. At the present time, when coal is so high in price in all the districts on the eastern coast where the population is most dense, great attention should be directed to the economy of fuel; because a vast amount is wasted, either through carelessness, or ignorance of the best modes of using it. We recently heard a manufacturer, who carries on a very extensive business, assert most emphatically that double the quantity of coal necessary for domestic and manufacturing uses, was consumed annually. The person who made this assertion is not a random declaimer, but a most intelligent and observing chemist, well acquainted with the theory and practice of combustion. About five million tuns of anthracite coal are now consumed annually, and with the present retail prices—for domestic use, eight dollars per tun, and six and a half dollars for manufacturers and steamships—the total cost to consumers will amount to about $37,000,000. There is great room for improvement in economizing fuel for steam engines; as it is well known that not one-fifth of the heat power capable of being obtained from coal is developed in the working of the best of them. And as used for domestic purposes, the waste of fuel is much more in grates, stoves, and furnaces, than under steam boilers. These remarks are equally applicable to the use of bituminous coal and wood.

A pamphlet on "The Economy of Fuel," by Henry Gerner, C. E., of this city, lately circulated, has been furnished to us. It is therein stated that furnaces may be altered according to his discoveries, to save from twenty-five to fifty per cent of the fuel. It contains a short treatise on the combustion of coal—a subject which the author seems to understand well. Coal requires an intense heat and a large supply of air to produce perfect combustion. When a furnace is charged with wood or bituminous coal, a portion thereof is liable to pass off unconsumed as smoke. To prevent this waste, air is now generally supplied above the fuel, to mix with the smoke to supply the requisite quantity of oxygen. The best modes of supplying air to furnaces, and in proper quantities, are important considerations. Too much or too little air supplied to fire, tends to waste fuel. It has for some time past been the practice to admit fresh air above the fuel, through small orifices in the furnace door, as well as between the bars of the grate, and to furnish the greatest quantity of air above the fuel immediately after a fresh charge. The English patent of Mr. Prideaux for producing perfect combustion and preventing smoke, is based upon this principle. Mr. Gerner asserts that this principle of supplying the air is wrong, and we think he is right. His method is to admit but a very small quantity of air above the fuel for about eighty seconds after a fresh charge, to prevent the furnace from being too much cooled down; and after this he furnishes a larger supply. He also advocates the use of compressed air by blowers, for all furnaces, as also for heaters in houses; and recommends that a supply of compressed air be furnished for buildings in cities, from some central establishment, conveyed by pipes in the same manner as gas and water. By this system air can be supplied both for combustion and ventilation. For all furnaces, in factories where a blower can be driven by steam power, it should be employed in preference to a tall chimney. On this subject Prof. Rankine says:—"When the draught is produced by means of a blowing machine, no elevation of temperature above that of the external air is necessary in the chimney; therefore furnaces in which the draught is so produced, are capable of greater economy than those in which the draught is produced by means of a chimney."

As no smoke is emitted from a chimney in burning anthracite coal, many persons suppose that no loss of its heat results in combustion like that arising from the smoke of bituminous coal. This is a mistake. All fuel requires about two pounds of oxygen for one of carbon, to produce perfect combustion; therefore the fire must be supplied with the requisite amount of air to convert the carbon when burned into carbonic acid (CO^2). But carbon, such as anthracite will also combine under combustion with one equivalent of oxygen and form carbonic oxide (C O)—a colorless gas. The bluish-colored flame sometimes seen at night at the top of the smoke pipes of steamboats, is caused by heated carbonic oxide gas meeting with oxygen which should have been supplied in the furnace. A vast amount of anthracite is wasted, from the same cause, in private families, as well as in public establishments and on steamers. Only one-third of the heat of coal is developed when the fire is furnished with but one-half of the air necessary to produce perfect combustion. In view of this scientific fact, we are confident that one-fourth, at least, of the coal generally used is wasted by passing off as carbonic oxide, and that with more care in burning it all this waste might be prevented.

AN HOUR IN A SCREW FACTORY.

Some time ago a pertinent question was raised as to what became of all the pins manufactured. We may ask, not unreasonably, what becomes of all the screws? During a recent visit to the city of Providence, R. I., we were permitted to visit the American Screw Factory in that place, and had an opportunity to examine the wonders of screw-making. We are not allowed to detail at length any of the processes by which the screws are made, and our readers must content themselves with the following generalization of the operations:

Screws, such as are used in ordinary carpentry and joiner work, are made from wire previously rolled especially for the purpose. This iron is of a very soft and even texture, and necessarily of the best quality. The coils of wire are not rolled on the premises where the screws are manufactured; but the several preliminary operations of rendering the wire fit for use, by drawing it to specified sizes and annealing it so that it will work more freely, are all carried on here, and are of a similar nature to the same work elsewhere. After the wire is annealed it is straightened by machinery, cut off to suitable lengths for the different numbers, and then headed up cold. In this condition the screw is merely a rivet. The next step is to trim or shape the head and nick it for the screw-driver, which is done on a machine, and afterward to cut the thread and pack up the finished article for transportation.

All this looks like a very simple affair; but if the reader could see hundreds of machines, all of one kind, in an apartment, and as many of another sort in other rooms: if he stood by and saw the heading machines closing up on the wire with an unexampled rapidity, or witnessed the nimble machinery further on in the works turning out the completed screws as often as one draws breath, he would not wonder that we raised the question "What becomes of all the screws?"

The appended statistics relative to the consumption of material may aid in arriving at some idea of the enormous quantity of wood screws made annually in the city mentioned. The American Screw Company has three factories, all of the largest size, two of which are in Providence, and the other in Taunton, Mass. At these factories are used from 12 to 13 tuns of iron per day, from 60 to 70 tuns of brass per year, and about the same amount of wrapping paper; other statistics are not important. Thirteen tuns of iron wire ¼ inch in diameter would reach a distance of 4,333½ feet. If all the wire was of the same size this would be a small item; but screws of an infinitesimal diameter, and from ¼ of an inch to 6 inches length are made here, and consequently there must be miles of wire consumed each day. These screws all go to supply the home market; a few go abroad, and some to the Canadas, but the amounts are not large. About 700 hands are employed, of whom two-thirds are females; and they presented a very interesting sight as they were busily engaged in packing up the screws. Each individual has a quantity of screws at hand, from which she scoops out a number and places them in the scale before her. This scale has been previously balanced for a gross, and consequently there is always that amount in the scale when the balance is even; thus all counting is saved, and the work proceeds with despatch. The goods are sold direct from the factory, the Company employing no agents. The capital stock is sold for 8 times its par value, and the amount of capital was stated to us at $1,000,000. The utmost cleanliness and order was visible throughout the entire place.

MECHANICS IN OUR ARMY AND NAVY.

While philosophers, savans, and scientists in general reap the reward of their efforts in merited honor and fame, too often the world loses sight of the labors of practical men, or individuals who have nothing but their willing hands, stout arms, and indomitable energies to lend to the duty of the hour. Of such as these are the soldier-mechanics of the war. The highest honors of the trench, the picket, the sap and mine; the mounting of guns, the tedious construction of forts, the repairing of broken engines and machinery, and the building of pontoons in the face of a furious cannonade—these perils are all encountered and borne daily without a murmur. We have known many instances of personal heroism during the present struggle, none the less brilliant and noble because the heroes belonged to the so-called humble walks of life, and were without a thread of bullion upon their shoulders to blazon forth their titles to the world. Nature stamped her mark upon these brave men, and they have in all their unblushing acts of heroism proved themselves worthy. The very first victim of the war was a machinist—a young man from Lowell, Mass., named Ladd; he fell when the Massachusetts regiment was attacked in Baltimore, and as if inspired by his example and fate, from that day until the present hour no peril has proven too great, or any hardship too severe for the endurance of mechanics. Facts speak for themselves; we have no disposition to laud one class of men over another; but the future historian of the war for the Union will fail in an important matter if he overlook the services, the indomitable courage, and the unflagging, unswerving loyalty of the sons of labor. Both in the field and on the sea are they present; and those who are familiar with cotemporaneous history can recal many instances where important operations would have halted, or limped slowly to success, without the mighty impetus lent them by the mechanics in the army of the Union.

Steam Frigate "Niagara."

The late George Steers, who was esteemed one of the most skillful modelers and constructors in the world of fast-sailing vessels, designed and built the frigate *Niagara*, the largest in the American navy. Her model is held to be faultless for securing speed; but with naval men she has never been a favorite, and under steam her speed has been only moderate. Her engines have been held to be deficient in power; and for about a year past, when her services might have been most valuable on the southern coast, she has been laid up at the Charlestown (Mass.) Navy Yard, undergoing extensive repairs. Her old engines have been taken out and more powerful ones substituted; and it is now expected that her speed will be greatly increased. The new armament of this frigate surpasses that of any other vessel in the world for weight of metal. It consists of twelve 200-pounder Parrott rifled guns on the spar deck, and twenty-four 11-inch smooth-bore guns for throwing hollow shot and shell, on the main deck. The old system of arming war vessels was based upon furnishing them with the greatest number of guns possible; the modern method consists in supplying a much smaller number, but of much greater caliber.

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DEATH OF MAJOR HUNT.

A sad accident occurred at the Brooklyn Navy Yard on the 1st inst., by which the country has been deprived of an able soldier, a man of science, and inventor. Major E. B. Hunt, of the Corps of Engineers, U. S. A., had been engaged for several months past in the construction of a new submarine battery, from which important results were anticipated; and while making experiments in that vessel on the day stated above, an asphyxiating shell accidentally burst, the gases of which caused him to fall down into the hold, producing contusion of the brain. He was quickly lifted and carried to the Naval Hospital, but all efforts to restore him proved unavailing, and he died during the day. He was a native of New York, and a graduate of the West Point Military Academy, in which institution he acted as Assistant Professor of Engineering from 1846 to 1849. After this he was engaged in the regular service, and for several months prior to the breaking out of the war was employed in the construction of the fortifications of Key West. When the war actually opened, and the secessionists were busy seizing the forts on the Southern coast, it was in great part through Major Hunt's sagacity and patriotism that our national fortifications in Southern Florida were saved. Major Hunt was an accomplished engineer, and a lover of natural as well as practical science. He was the author of several treatises on scientific subjects, and his "Physical Notes on Key West," relating to its climate, storms, yellow fever, &c., we published in a condensed form on page 391, Vol. VIII. SCIENTIFIC AMERICAN (current series). He was brother of ex-Governor Washington Hunt, of New York, and was a man of noble presence, generous nature, and cultivated mind.

OUR GOLD AND SILVER MINES--THE NATION'S WEALTH.

For thousands of years gold and silver have been the universal representatives of wealth and power. In the days of the Pharaohs these metals were weighed and exchanged as money; they are still weighed as money in China; they are still weighed among us and in Europe. Few persons are so low in the scale of being that they do not comprehend an idea of value as attached to the precious metals, and there are fewer still so elevated as to be beyond their influence. We know, indeed, that a man may be very wealthy, and yet entirely destitute of either gold or silver. A man may own houses, lands, bonds, mortgages, patent rights, &c., and these alone will make him wealthy. But if he desires to exchange one piece of property for another, he must either resort to the inconvenient and expensive method of common barter, or he must sell his property for money, and then with the money purchase the desired article.

Gold is the universal money of the world. In certain *localities* paper money may be issued; and, as in this country and in Europe, common consent or governmental enactment may give it credit and currency in domestic transactions. But this must necessarily be confined to a region in which such confidence can be established, or over which a government has jurisdiction. Nothing but gold and silver has ever obtained universal currency, or like these metals, has become exchangeable for all descriptions of property. The reasons for this are found in the nature of the metals themselves, and in the difficulties attaching to the acquisition of them in any considerable quantities, by mining operations. Their luster and beauty are of themselves good recommendations for their use as currency; but much stronger recommendations exist in the fact that they are incorrosive, and they are not found in sufficiently large quantities to rapidly deteriorate the value of the gold and silver which is already in market. It is true that the *quantity* of gold or silver mined has a tendency to depreciate its own value; but it must be remembered that property itself is increasing in *quantity*—more rapidly in this country than in any other—and this offsetting the increased yield of gold and silver, is still another influence operating to keep gold at par.

The auriferous mines within the limits of the United States are vast in number and of untold productive power. Our resources in gold and silver are equal to those of the most favored foreign nations. This fact, in view of our increasing national debt, the absorption of which rests upon our ability to promptly pay the interest, and ultimately the principal in gold, is one of transcendant importance. California is now producing 70 to 80 millions of dollars' worth of gold per annum, while Colorado is producing at least six millions. The following tables show the estimated production of gold in California from its discovery to the present time; and the sources and the total amount of domestic gold deposited at the United States mint and branches to the year 1862:—

Years ending Dec. 31.	*Estimated Production.—According to World, 8th June, 1861.*	*According to Hittell, 1861.*	*Exported from California to all parts.*	*Received per steamer at New York.*
1848....	$58,902	$10,000,000	$.....	$.....
1849....	8,196,678	40,000,000	4 921,250	.....
1850....	48,241,168	50,000,000	27,676,340	.....
1851....	84,134,355	55,000,000	45,989 000	.....
1852....	80,150,000	60,000,000	45,779,000	.....
1853....	99,864,753	65,000,000	54,965,000	.....
1854....	90,000,756	60,000,000	51,429,098	.....
1855....	79,969 603	55,000,000	45 182,631	41,682,424
1856....	88,715,608	55,000,000	50 697,434	40,319,929
1857....	85,556,955	55,000,000	48,976 697	34,222,903
1858....	83,043,287	50,000,000	47,548,025	36,179,344
1859....	83,055,757	59,000,000	47,744,462	39,975,750
1860....	74,068,750	45,000,000	42,325 916	33,499,400
1861....	70,000 000	41,680,000	41,676,658	34,379,547
1862....	74,000,000	42,540,000	42,561,761	34,882,846
Total...	$1,049,356,572	$734,220,000	$596,473,372	[$.....

SOURCES OF DOMESTIC GOLD DEPOSITED AT THE UNITED STATES MINT AND BRANCHES.

States, &c.	*Previous to 1848.*	*Since 1847.*	*Total.*
Virginia (1828-1862).....	$945,294	$613,511	$1,558,805
North Carolina (1804-1862)....	5,528,005	3,586,989	9,113,994
South Carolina (1828-1862)....	735,540	619,430	1,352,970
Georgia (1828-1861).....	5,345 933	1,563,196	6,909.129
Alabama (1838-1861).....	155,107	43,224	198,331
Tennessee (1838-1861).....	62,866	18,561	81,407
Atlantic gold fields.....	$12,770,725	$6,443,911	$19,214,636
California (1848-1863).....	$.....	$528,145,666	.....
Nevada (1861-1862).....	.....	53,846	.....
Utah (1860-1862).....	.....	80.067	.....
New Mexico (1848-1862).....	.....	56,929	.....
Arizona (1860-1862).....	.....	21,500	.....
Colorado (1860-1862).....	.....	4.753,050	.....
Nebraska (1860-1862).....	.....	1,402	.....
Washington (1862).....	.....	216	.....
Oregon(1853-1862).....	.....	963,458	.....
Western gold fields.....	$.....	$534,076,134	$534,076,134
Other sources.....	$37,850	$44,669	$82,519
Parted from silver (1862)....	.....	1,132,717	1,132,717
Miscellaneous.....	$37,850	$1,177,386	$1,215,236
Grand total.....	$12,808,575	$541,697,431	$554 506,006

To comprehend our future resources we should bear in mind the vast extent of our mining regions, in which lie, still undiscovered, a wealth of gold and silver far surpassing any human calculation, and the new facilities which science and the inventive genius of the age are bringing to bear upon the future yield of our mines.

The whole extent of the Rocky Mountain ranges in the States of California and Oregon and the Territories of Colorado, Nevada, Utah, Arizona, New Mexico and Nebraska, abound in mines of gold and silver. Immense regions are yet open to the explorer; and there are mines still undiscovered, whose probable yield will render insignificant our former successes. We do not imagine that there will be another excitement equal to that which resulted on the discovery of gold in California; but there will be a steady emigration toward our new territories, and a steadily increasing yield of the precious metals in return. Scientific investigations show that the quartz mines of Colorado, in reality, contain gold in larger quantities and more evenly diffused than the quartz mines of California. It is more easily separated from California quartz than from Colorado quartz, and hence the conclusion has been drawn that the California quartz is the richest. But in the one case the gold is saved, while in the other case it remains in the quartz. As a general rule but one-third of the gold is separated from Colorado quartz, while two-thirds are lost in the tailings and water races. The reason that it is obtained in the one case and lost in the other, is found in the different nature of the ores with which the gold is associated. While California quartz is comparatively free from, the Colorada ores contain, sulphurets of iron, copper, lead and antimony, and these greatly interfere with the separation of the gold by the ordinary processes of washing and amalgamation.

When scientific men and inventors shall have succeeded in saving this additional two-thirds of gold, now being constantly lost by means of inadequate mining apparatus, the entire yield of the Colorado mines will be three times as large. Already new processes having this object in view are being invented, and we know of two inventions which are now being put in actual operation at the Pike's Peak mines. One of these is a desulphurizing process, patented by Mr. Keith. His process desulphurizes the ore, and if in this respect it is effective and economical, it will liberate much of the gold heretofore held in such combination as to resist the action of mercury. The other process is the invention and patent of Mr. Edward N. Kent, of the United States Assay Office. His machine is intended to save, by amalgamation, all that has heretofore been saved at the mines, and in addition, in the form of a concentrated residue, much of the gold heretofore wasted. One of the results obtained by his invention is the removal of the quartz from a given quantity, say a tun of ore, leaving the gold before diffused throughout the whole mass, and which will not amalgamate, combined with but a few pounds of the original ore or sulphurets. This concentrated residue may be smelted at the mines or at New York and the gold entirely liberated.

There should be two sources of direct revenue to the government from the national gold mines. There should be a land rent charged for the privilege of mining, and a royalty charged upon the *quantity* of gold actually mined. The national gold mines belong of right to the *whole people*, and individuals who desire the privilege of exclusive possession and property should be willing to pay the people for a right which the people alone can confer. There is no production of labor which can be taxed with so great profit to the government, because the tax would be payable in the bullion itself, thus giving to the government the advantage of any premium it might bear. The tax would not be felt by the public at large, because as long as gold is principally used as a currency, the community gain nothing, but are rather losers, by an increase in the volume of currency; and if taxation resulted in a decrease of the number of miners or mining companies, the loss would never be felt by the public at large.

Business Prosperity.

More business of a commercial character, connected with manufactured goods, has been done in New York during the past month than in any previous similar month, with the whole Southern trade. One mercantile house in this city which once enjoyed a large Southern business, has lately sold goods to the value of $50,000 per diem, whereas its whole former trade never exceeded in value $30,000 per diem. Owing to the great rise in the price of goods, however, the quantity was about the same; but the company state that their loss of the Southern trade has been made up by a greatly increased Western business. Most all our merchants have been equally prosperous this fall; indeed, it is the prevailing feeling that if the Southern trade were to be completely extinguished hereafter the loss would not be sensibly felt. Domestic manufactures have been in great demand, especially woolen fabrics. It is not perhaps generally known that as good cloth is now made in America as in Europe. It has been supposed that the colors of foreign woolen goods were more permanent than those dyed in America, and many merchants and others entertain such opinions. They should be abandoned at once; because such notions are erroneous and injurious. The same substances and processes that are employed in Europe are employed in America by skilful European dyers. Some persons also imagine that the water and the air of Europe are more favorable for dyeing good colors; this is also an erroneous notion, as there is no difference in the character of the water and air in the two sections of the globe.

Manufacturers of hardware have also been very successful and busy this fall. When the people are kept busily employed, the country will be proportionately prosperous; for honest industry is the wealth of nations.

New York Canals.

The quantity of flour, wheat, corn and barley which has come through the canals to tide water, from the commencement of navigation until the 21st of August last, was as follows:—

	Flour—bbls.	Wheat—bush.	Corn—bush.	Barley—bush.
1862....	840,500	15,129,600	10,828,500	372,100
1863....	725,000	10,067,100	14,666,100	73,100

The canals opened May 1st. Although the business of the railroads has increased prodigiously during the past two years, the trade of the canals has not diminished, but has increased also, though not to the same extent.

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HUMAN HAIR.

In every age and country, the hair of woman has been considered an object of beauty; and St. Paul states that long hair is a glory to her. The form of human hair varies from that of a delicate round tube to that of a minute flat ribbon; and it is supplied through the interior with an oil from which it receives its peculiar color. Round hair is straight and is generally soft; while flat hair is usually crisp or curly. The ancient Greeks and Romans admired yellow or golden hair as a mark of female beauty; but tastes differ in individuals and nations. It cannot be questioned, however, that long soft hair, whether flowing in spirals, or in a waving form, and of whatever color—black, brown, or yellow—is attractive and much admired. Every woman seems to be animated with a natural desire to obtain long hair, and every man seems ambitious to preserve his natural head-gear in all its native strength.

Baldness.—As baldness is generally considered a calamity by both sexes, its causes should be investigated in order to provide a remedy, if this is possible. The *American Phrenological Journal*, in a recent interesting article on hair, states that baldness "is always an unnatural and therefore a diseased condition; though it by no means implies general derangement in all cases. It is believed by some to indicate power and activity of mind, and this may sometimes be the case; as undue mental exertion, by producing a febrile condition of the head, affects the hair in the same way as a fever, though not in the same degree. But we believe that baldness oftener than anything else, indicates the wearing of our modern water-proof and air-proof hats, which keep that portion of the head which they cover, constantly heated and unventilated. In corroboration of this remark it may be observed that the hair is generally thick and healthy below the point covered with the hat, and that women, who use no air-tight covering for the head, are seldom bald." As if to contradict this latter theory of the cause of baldness, however, the *Journal* adds, "We are told that of all the honors conferred upon Cesar, there was none that he accepted more gratefully than the right to wear the civic crown, which served to conceal his baldness." Cesar certainly never wore one of our modern water-proof air-tight hats; but he possessed an intensely active mind, which may have caused his baldness. We also read that the prophet Elisha was bald, though he surely never had the misfortune to wear an air-tight hat; for he went uncovered. Baldness is certainly due to a disease of the scalp, or the roots of the hair, but the cause of this disease is not understood. A recent writer upon this subject in England, states that the ancient Britons in their barbaric state, possessed hair long, strong, and sufficiently thick to resist the cut of a sword; and the prevalence of baldness in Englishmen of the present day he attributes in a great measure to increased mental pursuits.

Innumerable are the lotions and compounds now sold under the pretense of keeping the hair from falling out; others under the pretense of producing long flowing hair; while others again profess to cure baldness and restore the hair to all its youthful vigor. Hogsheads of liquids are sent forth under such pretenses; but they all seem to be as effectual in accomplishing their objects, as so much water. The *Phrenological Journal* comes nearer the truth, respecting the preservation of the hair, than all the professors of hair fertilization. It asserts that vigorous health conduces most to preserve the hair, and says "when all the vital functions are in good working order and activity, we find the hair bright, glossy, and pleasant to the touch; but on the contrary, when the body is diseased, the blood impure, or the system feverish, the hair becomes harsh, dry, and coarse, and the head covered with dandruff. With returning health, the hair resumes its original quality and condition."

Gray Hair.—With advancing years, the hair of the head loses the color of youth and becomes white. Gray hair is simply a mixture of white with hairs of the previous color—brown or black. This change of hue is not caused by disease of the hair itself, but from a want of the oil supplied by the hair follicles. White and gray hair grow as luxuriantly as the best crops of red, brown, or sable. The cause of the natural-colored hair oil becoming deficient, is not well known. It is on creditable record that many persons have become suddenly gray from fear and grief. Byron in his immortal "Prisoner of Chillon" touches on this topic with a master hand:

"My hair is gray but not with years,
Nor grew it white in a single night."

We are acquainted with a gentleman whose hair turned from a jet black to gray within two weeks, during intense mental study and anxiety; but, strange to relate, all those gray hairs afterwards departed and his dark locks returned again. In some families early gray hair is hereditary. The members of a large family of men and women known to us, have become gray at from twenty to twenty-five years of age, and almost snow-white at thirty-five. Their hair is strong and they are not subject to early baldness. The hair of the father of this family became white at an early age. In order to retain a youthful appearance, many persons dye their gray hair. Preparations of the nitrate of silver are chiefly used for this purpose. For the bald-headed, the only sure receipt to impart a more youthful aspect, is the use of an uncomfortable wig. During the early part of the last century, wigs were fashionable, and were worn by both old and young folks. When we gaze upon the pictures of the great men of that era, with their splendid flowing locks, it should not be forgotten that they were indebted to the wig-maker for them.

Long and Short Hair.—Many customs have prevailed among the fair sex respecting the mode of arranging the hair, and they have a right to adopt a variety of changes; but cutting the hair short and wearing it like boys is not commendable. Men have at different times worn the hair long. This has ever been condemned as an unscriptural custom. In the days of Charles the First of England, the Cavaliers, who despised close religious forms, wore long hair; while the Puritans cut theirs short, and were called "round heads." It has been calculated that by continual cutting and shaving of the hair, about seven feet in length is removed from a man in twenty-five years. Some writers assert, that the practice of close cutting and shaving tends to weaken the body. Such writers draw a powerful argument from old Sampson, who, when all unshorn, slew several thousand Philistines with the jaw-bone of an ass.

Color of the Hair.—All the native people living under the tropics have black hair; while the light-haired races are chiefly found in the cold regions. But this is not an arbitrary distinction, as all the aboriginal races on the American continent, extending from Patagonia to the Arctic sea, have black hair. The Danes of Europe are held to be the red-haired race; the Germans the fair-haired race. In Great Britain and Ireland, there is no distinctive color of the hair; but dark brown is the most common in the former, and black in the latter. The ancient Gauls of France and the Caledonians of Scotland, were described by the Romans as yellow-haired races; but this color of the hair is now seldom seen in any part of the world. As the people of the United States are composed of a mixture of all the European nations, their hair of course is as mixed in color as their descent; but in childhood, it is most generally fair, growing darker with advancing years, until full maturity is reached.

The President's Proclamation of Thanksgiving.

President Lincoln has issued a proclamation appointing the last Thursday of November as a day of general thanksgiving to Almighty God for the blessings and favors bestowed upon the land, even amid the havoc and desolation of our sad war. The proclamation is couched in chaste and beautiful language, and is pervaded with an humble and devout spirit. We take this opportunity of suggesting that all the governors of the loyal States appoint the same day for the usual States thanksgiving, so that it may be kept in the spirit of unity and the bonds of fraternal concord, by every household in the land.

Woodward's Mill, in Woodstock, Vt., consumes 175,000 lbs. of wool annually, all of the finest quality, and at present mostly foreign wool. The doeskins made are equal to the best French. Vermont grown wool is the finest in the world, having taken the first prize at Hamburg, in competition with European Saxony fleeces.

RECENT AMERICAN PATENTS.

The following are some of the most important improvements for which Letters Patent were issued from the United States Patent Office last week. The claims may be found in the official list:—

Grain Dryer.—This invention consists in the employment or use of a series of spiral conveyors in connection with perforated concaves, in which the conveyors are placed and work, and placed, with the concaves, over a kiln or hot-air chamber, and all arranged in such a manner that the grain to be dried will be moved along in a thin stratum, and subjected in the most efficient manner to the hot air, which dries the former by evaporating the moisture contained in it. It also consists in a novel way of feeding the grain to the conveyors and operating or driving the latter; and, further, in a means employed for cooling the grain after the drying process is performed, to admit of the grain being stored away safely in bulk. W. H. Sutton and J. J. Gibson, of Brantford, Canada West, are the inventors of this improvement.

Treating Sulphates of Copper, Cobalt and Nickel to obtain their Chlorides.—Heretofore it has been customary for the separation of two or more sulphates to use the difference of temperature or concentration of a solution and let it crystallize; but the sulphates of copper, cobalt and nickel—the separation of which cannot be effected by crystallization, nor by the usual mode of separation employed for those metals—have been precipitated by the addition of lime or other reagents, and then dissolved in muriatic or other acid, so as to obtain those metals as chlorides, in which form they are easily separated. The object of this invention is to obtain the chlorides of those metals in a more economical manner, and to this end it consists in the treatment of the sulphates by the use of chlorides of sodium or other compounds of chlorine, such as chloride of potassium, chloride of calcium, chloride of magnesium, chloride of strontium, and the hypochlorites of lime, potassa or soda; but especially the chloride of sodium, because of its cheapness and the readiness with which it can be obtained. Alfred Monnier, of Philadelphia, Pa., is the inventor of this improvement. Further information may be had of Geo. T. Lewis, of Philadelphia, Pa.

Diving Apparatus.—The object of this invention is to enable a diver to carry with him a sufficient supply of fresh air to last for several hours, and also buoys which he can inflate at pleasure, so that he can rise to the surface, whenever he thinks proper, without the aid of other persons. The invention consists in the application to an ordinary diving dress of a reservoir which is capable of containing a sufficient quantity of compressed air to last the diver for several hours, and which is strapped to the shoulders or otherwise secured to the dress, communicating with the interior of the same by a pipe provided with a faucet, in such a manner that the supply of air to the interior of the dress can be regulated at any moment, and the driver is free to move in any direction, carrying on his back the required supply of air; the invention consists also in combining with the diving dress and air reservoir two, more or less, expansible buoys communicating with the interior of the reservoir by means of a pipe or pipes provided with a faucet, in such a manner that by admitting air to the buoys the driver is enabled to rise to the surface whenever he may desire and without assistance. T. C. McKeen is the inventor of this apparatus.

Rock drilling Machine.—This invention relates to a new and improved rock-drilling machine for tunneling and other purposes, and it consists in constructing and arranging the parts in such a manner that the drill may be turned and adjusted in either a vertical or a horizontal plane, so that holes may be bored in any desired direction, that is to say, either vertically, horizontally, or at any degree of inclination between said positions, and at any point in a circle the plane of which coincides or is parallel with the axis of the drill. The invention further consists in a novel arrangement of means for operating the drill, whereby the same is drawn back from the hole after each stroke and turned while being drawn back, thus imitating or corresponding with the ordinary hand manipulation of the drill, the blow being given the drill by means of a hammer operated by a cam and

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springs. The machine is placed or fitted upon a truck to enable the drill to be readily placed in position or adjusted to its work. J. S. French, of San Francisco, Cal., is the inventor of this machine.

Stuffing for Mattresses &c.—This invention, which was patented last week, consists in a peculiar manner of treating cork waste, whereby the same is rendered soft and elastic. The stuffing thus obtained is particularly adapted for mattresses, its principal advantages being its coolness and cleanliness, affording no refuge to vermin. It is also free from moisture, and for these reasons a mattress made of this cork stuffing is particularly adapted for hospitals and for the army. Its lightness recommends it to masters of vessels. A. C. Crondal, of 36 Mott street, New York, is the patentee of this improvement.

APPLICATIONS FOR THE EXTENSION OF PATENTS.

The following persons have applied to the Commissioner of Patents for the extension of their patents :—

Improvement in Rotting Flax.—Lemuel W. Wright, of Palmer, Hampden county, Mass., has petitioned for the extension of a patent granted him on the 25th of December, 1849, for an improvement in rotting flax, said patent expiring Dec. 25, 1863. It is ordered that the case be heard at the Patent Office, Washington, on Dec. 7, 1863, at 12 M. All persons interested are required to show cause why the claim should not be granted. Persons opposing extension are required to file their objections in writing at least 20 days before the day of hearing.

Spark Arrester.—James Radley, and Margaret D. Hunter, of New York city, Administrators of John W. Hunter, deceased, for an extension of a patent on a spark arrester, obtained on Jan. 2, 1850, and which expires on Jan. 2, 1864. Claims to be heard Dec. 14, 1863.

Steam Boiler Furnaces.—Benjamin Crawford of Allegheny City, Pa., for an extension of patent granted him for an improvement in steam boiler furnaces, on Jan. 29, 1850, and which expires Jan. 29, 1864. Claims to be heard Jan. 14, 1864.

All persons interested in the above cases are notified to appear (as per directions in the first case) and state their objections, &c., at the Patent Office, Washington, D. C.

NEW BOOKS AND PUBLICATIONS.

WHAT TO EAT AND HOW TO COOK IT. P. Biot. D. Appleton & Co.

It is an old adage that "Heaven sends meat but the devil sends cooks;" and in view of the messes, misnamed food, served up daily in a thousand homes in the land, it would seem as though a little instruction in the art of cooking is sadly wanted. It is just as necessary to perfect health that food should be appetizing and wholesome, as it is imperative that man must eat to preserve life; and here it is that good cooking fulfils an important part in the economy of life. No man need make a god of his belly, as the saying is; but the simplest food may be easily spoiled by one ignorant of the first principles of the culinary art. In the book before us there are a quantity of recipes for cooking every conceivable kind of game, meat, vegetables, soups, &c., and to judge from the modes of preparation they are not only wholesome and savory, but cheaply made—a consideration of no small importance at the present time. Innumerable cookery books have been written, but we have seen none more comprehensive or more clearly written than "What to Eat and How to Cook It."

TO OUR READERS.

PATENT CLAIMS.—Persons desiring the claim of any invention which has been patented within thirty years, can obtain a copy by addressing a note to this office, stating the name of the patentee and date of patent, when known, and inclosing $1 as fee for copying. We can also furnish a sketch of any patented machine issued since 1853, to accompany the claim, on receipt of $2. Address MUNN & CO., Patent Solicitors, No. 37 Park Row, New York.

RECEIPTS.—When money is paid at the office for subscriptions, a receipt for it will always be given; but when subscribers remit their money by mail, they may consider the arrival of the first paper a *bona-fide* acknowledgment of our reception of their funds.

NEW PAMPHLETS IN GERMAN.—We have just issued a revised edition of our pamphlet of *Instructions to Inventors*, containing a digest of the fees required under the new Patent Law, &c., printed in the German language, which persons can have gratis upon application at this office. Address MUNN & CO., w, New York.

ISSUED FROM THE UNITED STATES PATENT-OFFICE

FOR THE WEEK ENDING SEPTEMBER 29, 1863.

Reported Officially for the Scientific American.

*** Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

40,088.—Suspension Rack for Coupon Tickets, &c.—E. P. Bacon, Milwaukie, Wis.:

I claim a case or rack, for coupon tickets or other articles to which it may be adapted, provided with horizonal bands or supports, a a, attached to upright standards, b b, with projections, d d, on the latter, at the several points of intersection, hooks or other means of suspension being affixed to the horizontal bands, from which tickets or other articles may be suspended, when constructed in this or any other manner substantially the same, for the purposes set forth.

40,089.—Marking Brush.—E. P. Clark, Northampton, Mass.:

I claim the elastic fountain, B, in combination with the tube, A, and brush, G, as shown and described for the purpose set forth, also the brush, G, connecting with the handle, C, sliding within the tube, A, in the way and for the purpose before described.

40,090.—Furnace for Grain Dryers.—M. C. Cogswell, and A. G. Williams, Buffalo, N. Y. Ante-dated Sept. 20, 1863 :

We claim the arrangement of the flues, c c1 c2 c3 and D (including their valves) relatively with the blower, H, hot-air chamber, E, and pipe, M, for the purposes and substantially as described.

40,091.—Flax Brake and Swingler.—Samuel Cowan, Bloomfield, Iowa:

I claim the combination of the rollers, F G N O, with the endless aprons, B and I, and reel, P, when the two latter move at the same speed, substantially in the manner and for the purposes herein set forth.

I also claim combining with a flax brake, constructed and operating as herein described, the swingler, T, substantially in the manner and for the purposes set forth.

40,092.—Cartridge Bullet.—W. H. Dibble, Middletown, Conn.:

I claim the within-described new article of manufacture, to wit: A quick powder, ductile-metal tubular cartridge projectile, a b c e, with a quick powder charge, within it, and with a fibrous covering, h, and a highly inflammable cementing and igniting cap, i, all as set forth.

40,093.—Skate Fastening.—W. H. Dutton, Utica, N. Y. Ante-dated Sept. 20, 1863 :

I claim, first, The metal loops, as constructed and provided with the posts and buttons, H, in combination with the stationary straps, in the manner and for the purpose described.

Second, The double turn or pulley in the strap, in combination with the metal loops and button fastenings, as described and for the purposes described, the whole being arranged and operating substantially in the manner herein set forth.

40,094.—Lamp.—M. B. Dyott, Philadelphia, Pa.:

I claim a lamp made with a drip-trough depression, b, at its neck and a handle-depression or indentation, C, at its side, with attached handle, C, therein, all as herein shown and described.

[This invention relates to that class of lamps designed for burning coal oil, and it is believed that it possesses many advantages over the ordinary burners.]

40,095.—Cultivator.—B. F. Field, Sheboygan Falls, Wis.:

I claim, first, The arm or drag-bar, G, when constructed as described.

Second, The combination of the arm, G, the cultivator, E F, the independent rolling shield, K, and the arm, L.

Third, The combination of the crank, R, the pulleys, t and s, the shaft, P, and the cords or chains, r and p, for the purpose of elevating the cultivators and shields.

Fourth, Making the wheels of a cultivator adjustable on their shaft or axle, by means of the collars, n n, and set screws, o, substantially as set forth.

40,096.—Cultivator.—B. F. Field, Sheboygan Falls, Wis.:

I claim, first, A cultivator shear, when constructed substantially in the manner described, to be attached to the ordinary drill tooth.

Second, The long handle, H, in combination with the lifting bar, G, substantially as described and for the purpose set forth.

40,097.—Rock Drilling Machine.—J. S. French, San Francisco, Cal.:

I claim, first, The manner of arranging the frame, I, of the machine, so that it and, consequently, the drill, T, may be adjusted in either a vertical or horizontal position or at any degree of inclination between those positions, and at any point in a circular plane parallel with the axis of the drill, to wit: by having the frame, I, hung loosely on an arm, i, which is attached to a block or nut, F, fitted in a vertical column, C, having a screw, G, placed in it, which passes through the block or nut, and the column arranged to turn on a plate, B, on the truck, A, the column being retained at any desired point, and also the frame, I, by the means herein described or their equivalents.

Second, The drawing back of the drill, T, after each stroke, by means of the slide, R, connected with the drill through the medium of the collar, d', fitting in the ledge, c', on the slide, the slide being operated by the rack, r', pinion, s, pawl, S, and crank, n on shaft, K, and springs, u u, or their equivalents as set forth.

Third, Rotating or turning the drill, T, during its backward movement, by means of the box, V, gearing, f' g', ratchet, h', and pawl, V, attached to the pawl, S, substantially as set forth.

Fourth, Operating the hammer, Q, through the medium of the cam, L, slide bar, M, and springs, P P, substantially as specified.

40,098.—Hay Fork.—Theodore Foster, of Coxsackie, N. Y.:

I claim, first, The hinge, b, secured to the top of the handle, B, and operating in combination with the latch, D, and with the fork, in the manner and for the purpose herein shown and described.

Second, The ring, g, and loop, f, in combination with the toggle arms, d d, catches, c c, and latch, D, all constructed and operating in the manner and for the purpose specified.

[This invention relates to certain improvements in the arrangement of the bale from which the fork is suspended, and those parts which retain the bale while the fork is hoisted, and releases the same and allows the fork to tilt when it is desired to discharge the load; also, to a certain improvement in the position and shape of the tines, whereby the same are rendered more firm and less liable to break than tines of the ordinary construction.]

40,099.—Printing Press.—G. D. Gordon, Brooklyn, N. Y.:

I claim, first, Locking and holding a rocking platten securely in a stationary position for the purposes fully described.

Second, I claim placing the shaft of the rocking platten between the impression shaft and the vibrating bed shaft, thus causing the shafts to fall in a direct line with the connecting rods, at the moment of impressions, for the purpose or purposes set forth.

Third, In combination with the shafts so arranged, I claim the manner described of operating the rocking platten for the purpose specified.

Fourth, I claim the end gage, Y, constructed and operated substantially as shown; also, the combination of such end gage, Y, into the drop gage, X, for the purposes herein fully described.

40,100.—Axle Box for Vehicles.—S. F. Green, Croton Falls, N. Y.:

I claim, The combination with the two parts of the divided box, D, axle, A, and nut, B, of the nut, E, in the manner and for the purpose herein shown and described.

[Ths invention consists in having the axle box made in two longitudinal parts, and having a screw thread cut on the outer ends of said parts to receive a rack, which is provided with a circular plate or flange to fit into the outer end of the hub, and serve as an outer bearing for the box and retain the same in a firm position in the hub, the interior of the box being lined with Babbitt metal, whereby the usua difficulty of the working of the box in the hub is avoided, and the box and axle are rendered capable of resisting much wear.]

40,101.—Sheep Rack.—William Heaton, Center Township, Pa.:

I claim the sheep rack, provided with the double inclined bottom, E, sliding fenders, O, and feed-holders, G, provided with prongs, I, the whole constructed, arranged and operating substantially as herein set forth.

40,102.—Slate Pencil Sharpener.—J. M. Hicks, Boston, Mass.:

I claim the manufacture of slate pencil sharpeners or other equivalent instruments, without a separate casing or frame, permanently to hold the roughened surfaces in their relative position as set forth, by forming both roughened surfaces upon one plate or piece, which is bent in the manner and for the purposes herein described.

40,103.—Quartz Crushers.—Alonzo Hitchcock, Chicago, Ill.:

I claim the combination of the circular cap and trough and the three crusher wheels, constructed and operated substantially in the manner described.

40,104.—Cooking Stove,—J. R. Hyde, Troy, N. Y.:

I claim, first, In a cooking stove having an oblong fire-chamber, A, with pot-holes, h h', over it, and a live air-chamber, D D, alongside with apertures, e, between, and a fire-flue, F, extended from the said fire-chamber first over the said air-chamber, as herein described, the removable air-chamber cover, i i, constructed in several parts and secured to the said air-chamber by clamps, k k, as and for the purposes herein set forth.

I also claim a cooking stove having two separate sub air-chambers, D D, arranged between an oven, L, and a fire-chamber, A, and communicating with the latter by apertures, e e, and with the open air by passages, m m', separate from each other and from the main draft-chamber, C, and provided with independent dampers, n n', when a fire-flue, F, is extended from the said fire-chamber along the said oven, and under pot-holes, h h1 h2 h3, in a top-plate, G, substantially as herein described.

40,105.—Adding Machine.—M. C. Jeffers, New York City:

I claim the combination in an adding machine of the wheels, B B, hubs, C C, and verges or scapements, F F, substantially as and for the purposes set forth.

40,106.—Register for Account Books.—A. F. Jones, Douglas, Mass.:

I claim the merchant's monitor, being circular to ecomise room, revolving for greater convenience, and to save steps by bringing the books round to the operator, with movable cases and alphabetically and numerically arranged, essentially as above described.

40,107.—Planting Hoe.—C. N. Jones, Galway, N. Y.:

I claim the arrangement of the foot, E', at the lower end of the seed slide, E, when the latter works in a box, C, secured to the handle of a hoe, A, in the manner and for the purpose shown and described.

[The object of this invention is an attachment to an ordinary hoe whereby corn or other seed can be dropped simply by pushing the hoe down on the ground, and the time usually lost in counting the kernels can be saved.]

40,108.—Chime Bell for Horses.—Charles Kirchhof, Newark, N. J.:

I claim, first, The contrivancer, a a, or its equivalent, to attach and support on or above the horse a number of bells and clappers or their respective equivalents, connected with each other and with the contrivance in the manner and for the purpose as specified.

Second, The combination of rein rings or equivalents with said contrivance as set forth.

Third, The method to produce a peculiar harmonic prolonged alarm by governing and extending the operation of the hammers or clappers and bells by means of springs or vibrating materials, and by other devices described, and the manner in which these different parts are arranged and combined with each other, and also with the contrivance, a a, as specified herein.

40,109.—Attaching Labels to Bales, &c.—E. A. Locke, Boston, Mass.:

I claim the carrier, A, when made with an end gradually tapering to a point, and preceding the anchoring device, provision being made in or on the carrier for attachment thereunto of the detachable anchor.

And I claim so making the anchor that it may be attached to the side and near the point of the carrier, so as to pass easily into the bale with the carrier, and be left therein on withdrawal of the same.

40,110.—Washing Machine.—T. R. Markillie, Winchester, Ill.:

I claim, first, The combination of the furnace, C, with the bottom-plate, of a washing machine in the manner and for the purposes as described.

Second, The method of operating the traveling squeezer, L, by means of the crank-shaft, F, pitman rod, I, and swing arms, h, herein described, whereby the purposes set forth are effected in a simple and efficient manner.

40,111.—Cartridge.—Edward Maynard, Washington, D. C. :

I claim the formation of one or more clasping or retaining tongues in the upper rim of a metallic cartridge by slitting the edge of the same substantially in the manner and for the purpose herein set forth.

40,112.—Metallic Cartridge.—Edward Maynard, Washington, D. C.:

I claim combining with a metallic or otherwise cartridge, a suitable retracting arm, chain, thong or cord, in such a manner as to avoid the necessity of a distinct or unusually thick bottom thereto, substantially in the manner hereinbefore described.

40,113.—Car Seat Lock.—George McGregor, Cincinnati, Ohio:

I claim the arrangement and combination of the case, A, with lug, j, and pin, m, hollow key, C, with double shouldered bit, k, and spring bolt, B, all constructed and operating in the manner and for the purpose shown and described.

[The object of this invention is a latch peculiarly adapted for locking the backs of car seats in either position in which the same may be brought, and arranged in such a manner that the same can be made at a trifling expense, requiring a comparatively small quantity of metal, and that is strong, durable and not liable to get out of order.]

40,114.—Diving Apparatus.—T. C. McKeen, Dunkirk, N. Y.:

I claim, first, The employment of the independent air knapsack, B, constructed and operating substantially in the manner and for the purpose herein shown and described.

Second, The arrangement of the expansible buoys, C, and secondary reservoir, D, in combination with the air reservoir, B, and diving dress, A, constructed and operating substantially as and for the purpose described.

40,115.—Guard Attachment for Locks.—William Miller, Boston, Mass.:

I claim the clasp, D, constructed substantially as shown, so as to be

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capable of being fitted on the bore, a, of the key, C, with one end in the keyhole, E, as and for the purpose set forth.

40,116.—Separating Copper Nickel and Cobalt.—A. Monnier, Philadelphia, Pa.:

I claim the treatment of sulphates of copper, cobalt and nickel, by means of chloride of sodium or other compound of chlorine, substantially as and for the purpose herein set forth.

40,117.—School Desk and Seat.—James Monteith, New York City:

I claim so attaching the board, C, to the settee or chair by pivots, a a, or their equivalents, that it may be brought either to a position to form a seat or turned up back, and over to a position to form a desk, substantially as herein specified.

[This invention consists in so attaching the seat to a settee or chair, that it may be turned up and over the back to form a desk.]

40,118.—Steam Boiler.—James Perkins & Wm. Burnet, Newark, N. J.:

We claim, first, The combination of the cylindrical boiler, A, with the boiler, B, and short cylinders, C C, in such a manner that the position of B, is horizontal and also parallel and perpendicular to the boiler, A, so that the steam generated in B, will ascend in a perpendicular line through C C, to A, without obstruction.

Second, We claim the combination of the tubular or other, B, with the horizontal partition, E, and extension thereof, G, substantially in the manner and for the purposes described.

Third, We claim the combination of the boiler, B, with its setting E G and G′, substantially in the manner and for the purpose described.

Fourth, We claim the combination of the parts, A B E F G and G′, substantially in the manner and for the purposes described.

40,119.—Water Elevator.—Isaac A. Pinnel, Galva, Ill.:

I claim the forked hand lever, E, and brake, f, in combination with the drum, A, and wheels, C and D, constructed and operating in the manner and for the purpose herein shown and described.

[The object of this invention is an improvement in that class of machines which are generally used to facilitate and regulate the operation of raising and lowering well-buckets.]

40,120.—Potato Digger.—Wm. Proctor & David C. Payne, Elkhart, Ind.:

We claim, first, The employment or use in a potato digger in connection with the plow share, as aforesaid of rotary cutters, H H, applied at each side of the plow share, to sever stalks or weeds.

Second, The combination in a potato digger, substantially as described, of a series of two or more revolving rakes, J j, to carry the potatoes backward from the plow share, and pulverize and separate the earth, in combination with the plow share, G, as specified.

Third, The combination with the aforesaid rakes, J j, and inclined open frame, I I, with a plow, G, constructed, arranged, and operating as specified.

Fourth, The combination with the gear frame, D, constructed and operating as described, of cogged segments, F, shaft, f, and lever, F′, for raising and lowering the same.

Fifth, The endless carrying apron, K, constructed with alternate slats, k k′, of unequal width, substantially as and for the purposes specified.

Sixth, The combination with the endless apron, K, when constructed as described of the rotary rake, N n, operating in the manner and for the purposes specified.

40,121.—Breech-loading Ordnance.—Robert B. Reynolds, U. S. Navy:

I claim the arrangement with the exterior and lower portion of the gun, of the lobes, d d, rock-shaft, C, toggle, e g, stop, i, and breech-piece, B, operating together in the manner herein shown and described.

[This invention consists in a novel arrangement of mechanism for operating a sliding breech-piece and in an improved system of boring and rifling breech-loading ordnance, whereby some important advantages are obtained.]

40,122.—Buffer Spring for Railroad Cars.—A. H. Rowand, Allegheny City, Pa.:

I claim, first, A bumper or buffer composed of a series of overlapping plate metal springs, so arranged as to form a continuous spring, and having a bulge or swell in the middle; a smaller bulge at each end and a contraction or neck between the bulges, when constructed and operating substantially in the manner described for the purposes set forth.

Second, The combination of the spring, A, double convex tongue, D, and draw-bar, B, when arranged and operating substantially in the manner described, and for the purposes specified.

Third, The combination of the spring, A, double convex tongue, D, and flanges, F, in the manner and for the purpose described.

40,123.—Car Wheel.—Thomas Sharp, Chicago, Ill.:

I claim constructing a two-flanged car wheel of a single casting, when the outside flange is placed at such a distance from the inside flange that the wheel is adapted to the two different gages hereinbefore described, substantially as herein specified and set forth.

40,124.—Manufacture of Steel Traps.—Amos Shepard, Plantsville, Conn.:

I claim a steel trap having its base-plate or base-bar, A, projections, c, and arms, journals or pivots, e e, of the bait-plate, B, and the pawl or catch, C, all cast in one piece and of malleable cast-iron, as herein specified.

[This invention relates to an improvement in the construction of the cheap style of traps, such as are manufactured of scrap iron, and imported and sold at a very small cost.]

40,125.—Water Elevator.—Orlando Shepard, Rochester, Ohio:

I claim the double cone, C C, of the windlass, with the double rope, F F, and pulley, E, when constructed, arranged and operating substantially as and for the purpose set forth.

40,126.—Automatic Feeder for Sugar Evaporators.—Jonathan Smead, Pawlett, Vt.:

I claim the combination of the adjustable float, B, and the valve, e, and its lever, C, or the equivalents thereof, with the induction pipe, D, the supplying cistern, A, and the syphon, G, applied to the latter, the whole being for the purpose and to be employed substantially as specified.

I also claim the combination of the valve vessel, E, and the guard, g, with the induction pipe and the valve thereof.

I also claim the syphon, G, as made with the air vessel, k, and the cup, H, or with either applied to it, substantially as and for the purpose or purposes as specified.

40,127.—Binding Guide for Sewing Machines.—George R. Smith, Dowagiac, Mich. Ante-dated Sept. 12, 1863:

I claim the combination in the manner herein shown and described, of the lining pieces, d d′, and guiding strips, i i, with the laterally and vertically adjustable jaws, a a′, slides j j, and plate, A, all as set forth.

40,128.—Saddle or Sweat Cloth.—Robert Spencer, Newark, N. J.:

I claim, first, The use of the pockets, C C, or their equivalents, attached to the under part or lining of the saddle, and wholly or partially covering the tree and adjusted to be put on or off, substantially in the manner and for the purposes described.

Second, I claim the combination of A B and C, substantially in the manner and for the purposes described.

40,129.—Absorbing and Ventilating Sweat or Saddle Cloth.—Robert Spencer, Newark, N. J.:

I claim, first, The ventilation of the saddle cloth by means of the distinct perforations, p p p p, partially or entirely through the fabric, substantially in the manner and for the purposes described.

Second, I claim the parts, A B and C, in combination with the perforations, p p p p, substantially in the manner and for the purposes described.

40,130.—Grain Dryer.—Wm. H. Sutton & James J. Gibson, Brantford, Canada West:

We claim, first, The perforated metal plate, B, bent so as to form a series of paarallel concaves, a, in combination with the spiral conveyors, D, and a kiln, A, all arranged to operate substantially as and for the purpose herein set forth.

Second, The conveyor, J, placed within the perforated tube, H, fitted within a close or tight box, I, and communicating with the chute, G; in combination with a fan or other blast generating mechanism, all arranged substantially as shown and in connection with the grain drying mechanism to operate as and for the purpose set forth.

40,131.—Wool Carding Machine.—Daniel Tainter, Worcester, Mass.:

I claim, first, The combination with the flange, D, when cut or cored out as described, of the peculiarly constructed arch cap piece, a, with its bead or molding, c, as and for the purposes set forth.

Second, The combination of the ears, i i, and hooks or angular projections, f, with the wings or arms, A or B, and hooks or notches, d′, upon the main frame, F, for the purpose of retaining the wings or arms, A or B, in their proper or relative positions as described.

40,132.—Coal Stove.—W. B. Treadwell, Albany, N. Y.:

I claim, first, Constructing the fire-brick, F, with horizontal arched openings, h h, and vertical openings, h′ h′, communicating therewith, substantially in the manner and for the purposes described.

Second, Arranging the fire-brick, F, with its arched openings, in such a relation to the flue, H, surrounding the supply cylinder, G, and the descending flues, E E, surrounding the fire-pot, that either a descending or ascending draught may be obtained by regulating the single damper valve, b, substantially as set forth.

Third, The cylindrical, flanged, metallic lining, d, in combination with the fire-brick, F, constructed substantially as and for the purposes described.

Fourth, The circular plate grate, K, constructed with concentric openings through it in combination with vertical fingers, S S, of a circularly vibrating rake, substantially as described.

Fifth, Constructing the illuminating door frame with a tongue on its inner surface, and the door box, J, with a corresponding groove on its outer edge, in combination with the nut fastening, i j, as set forth, whereby a closely fitting tongue and groove joint is obtained when the door is closed, substantially as described.

Sixth, The revolving or rocking agitator, L, provided with projections, m m, on its sides, said agitator being arranged at the base of the supply cylinder, G, substantially as and for the purposes described.

Seventh, In a base burning stove having a supply cylinder, G, and a flaring fire-pot, B, I claim interposing between said cylinder and pot the perforated fire-brick lining when the same is arranged at the point where the combustion of the fuel takes place most rapidly and is supported directly or indirectly by the fire-pot, B, and the cylinder, A, substantially as described.

Eighth, The combination and arrangement of flue space, H, supply cylinder, G, chamber, B′, flues, E E, chamber, D, fire-pot, B, and arched fire-brick lining, F, the whole operating substantially as described.

40,133.—Receiving Magnets.—S. F. Van Choate, New York City:

I claim, first, Locating the armature or vibrator of an electro-magnet, together with the core within the coils and concentrically therewith, substantially in the manner herein before set forth.

Second, In combination with an armature located within the cylinder of the spool or coils, I claim the horse-shoe magnet, so shaped that both of its ends are within the cylinder of the spool or in line of its axis, substantially as set forth.

40,134.—Railway Dumping Car.—Anthony Welsch, Chicago, Ill.:

What I claim as my invention in the construction of dumping cars are the bearings, H H, revolving on the end of a bent shaft, that forms the axle for the friction rollers, E E, as and for the purposes herein described and set forth.

40,135.—Fountain Pen.—Joseph Weller, Washington Court House, Ohio:

I claim the central rod, B, provided with a conical shoulder or stopper, b, adapted to fit a countersink in the converging tube, a, in combination with the rocking lever, C, rod, D, and helical spring, E, when arranged to operate in the manner described.

Also in combination with the above described parts the plug, i, attached to the rod, B, and serving to open and close an air ventage in the fountain, in the manner and for the purpose described.

[The nature of this invention consists in a novel contrivance in a fountain pen, whereby the penman is enabled to supply the nib with fluid, according as it is needed for either a fine or coarse hand-writing, without removing his hand from the paper: also, to prevent the pen under any circumstances being surcharged with fluid.]

40,136.—Stopping Bottles.—Anton Wiegand, Philadelphia, Pa.:

I claim the employment for the purposes specified, of the device described; the same consisting of the collar, E, swinging bow, D, screw, B, and cap, C, constructed and applied together to a bottle so as to operate substantially in the manner described and set forth.

40,137.—Coffin.—Samuel H. Young, St. Louis, Mo.:

I claim, first, Arranging the deodorizing chamber on the outside of the coffin body instead of within it, in the manner and for the purpose described.

Second, I also claim the combination of the external deodorizing box, with the wooden coffin made air-tight, by the means herein above set forth.

40,138.—Window Sash Lock.—Wm. E. Arnold (assignor to H. G. Arnold & J. H. Castle), Rochester, N. Y.:

I claim the slide, D D, or its equivalent, in combination with the tumbler, C, and catch-box, A, and upright, B, substantially as herein set forth and described and for the purposes herein named.

I also claim the guide, G, and stop, S, or their equivalents, arranged with the tumbler, C, the whole combined with the box, A, substantially as and for the purposes set forth.

40,139.—Window Sash Lock.—Wm. E. Arnold (assignor to H. G. Arnold & G. H. Castle), Rochester, N. Y.:

I claim the combination of the joint, B or B B, nib, A, grooves, G and F, or their equivalent for the purpose of perfecting a combined horizontal and gravity motion to the bolt, and at pleasure to form either a right or left-hand fasten or lock, the whole being made, arranged and combined with the box, substantially as herein set forth and described, to hold the sash up or down.

Also the notch, E or G, in combination with nib, A, or its equivalent, and joint, B or B B, for the purpose of securing the bolt when down from being pushed inward or upward by any pressure, that may be brought to bear upon the outer end of it, substantially as herein set forth and described.

I also claim the adjustable joint, B B, when arranged with the bolt and box, for the purpose of varying the length of the bolt to the different widths of sash, as herein set forth and described.

40,140.—Machine for turning Irregular Forms.—C. B. Conant (assignor to himself and J. D. Eager), Springfield, Mass.:

I claim combining the tenon machine with the lathe in such a manner that both shall be operated simultaneously, and that one shall so control the motions of the other that the operation of each shall be performed at the proper time, for the purpose of turning out complete articles on which round as well as straight work is to be done, substantially in the manner and for the purpose herein described.

I also claim, in combination with the vertical carriage, A′, the adjustable tenon cutters, C′, and belt pulleys, G′ H′ I′ K′ and F′, when constructed and operated substantially in the manner and for the purpose described.

I also claim the arrangement of the lever, 6, with its links, connecting rods and jaws, M′, for the purpose of opening and closing said jaws on the endless screw, N′, which operates the tenon carriage, substantially in the manner and for the purpose herein described.

I also claim the combination and arrangement of the sliding cam, 12, and bolt, 22, and the devices to operate it, with the lever, K, for the purpose of automatically closing the jaws, L, upon the screw, H, to operate the lathe carriage at the proper time, substantially in the manner herein described.

I also claim connecting the lever, R, of the polishing wheel cutter frame, L, and lever, u, of the friction wheel, W, by means of the adjustable rods, s and x y, substantially in the manner and for the purpose described.

40,141.—Neck Yoke and Whiffletree.—A. S. Dow (assignor to himself and E. W. Wilcox), Cerderville. N. Y.:

I claim the combination of the leather or other packing, D, with the ring, B, made in two parts and united by the screws, d d′ d″ d‴, or their equivalents.

And I also claim the combination of the tubular or cylindrical portion made in two parts, as described, with either a neck yoke or whiffletree, substantially as and in the manner set forth.

40,142.—Projectile for Ordnance.—Halvor Halverson, Cambridge, Mass., assignor to Charles Spear, Boston, Mass.:

I claim allowing the escape of the air on the ramming home of the shot and preventing windage by diminishing the diameter of the shot at or near its base, in combination with the packing and base plate and the air channels and openings, substantially as set forth.

40,143.—Preparation of the Roots of Plants for Useful Purposes.—J. N. Katzenmeyer (assignor to himself and W. C. Molo, New York City:

I claim as a new manufacture, preparing or treating and utilizing, substantially in the manner herein described, the roots of plants or shrubs of the character hereinbefore referred to, for the purpose of making it available for the production of brushes, besoms and other like implements.

Second, I claim as a new article of manufacture, brushes, besoms and other like implements made substantially in the manner hereinbefore described, of the roots of plants or shrubs of the character hereinbefore referred to.

40,144.—Cork-cutting Machine.—George Lloyd (assignor to Edward Bovie and Alex. Mackie), Philadelphia, Pa.:

First, I claim the annular revolving knife, E, when the same is applied to the cutting of corks, substantially as described.

Second, In combination with the said annular knife, I claim any desired number of spindles, K and W, whereby the blocks of cork are held and turned as described, for the purpose specified.

Third, The disks, I and I′, on the tubular spindle, h, the plates, J and J′, attached to the disk, the segments L and L′, secured to the shaft, G, which passes through the said tubular spindle, h, the whole being arranged for carrying and operating any convenient number of spindles, K, with cog wheels, e, substantially as set forth.

Fourth, The spindles, K, each being provided with a roller, c, or its equivalent, and a spiral spring, f, in combination with the bent plate, M, or its equivalent;

40,145.—Self-locking Window Hinge.—J. R. Murphy assignor to Alexander Speer), Pittsburgh, Pa.:

I claim the combination with the two parts of a hinge, the shoulder, i, upon the pivot pin, and the cam-shaped or eccentric opening, and the shoulder formed in the wall thereof, for the purpose of locking a shutter or door back, and at the same time concealing the locking mechanism, substantially as described.

40,146.—Stove Grate.—G. H. Phillips and W. H. Johnson, Troy, N. Y., assignors to Anson Ingraham, Center Cambridge, N. Y., G. H. Phillips aforesaid, and Wm. H. Ingraham, Troy, N. Y.:

We claim, first, A fire grate, A, having two shanks or journals, of which only one, b, is supported by a ring, D, surrounding the grate, and the other one, c, by a bearing separate from and outside of the said ring, the latter being mounted on an annular or open base, E, and connected with both of the said grate shanks by lateral bearings, h h i i, substantially as herein set forth.

Second, We also claim the combination of a perforated slide, g, and slotted casing, L, with a grate, A, having two supporting shanks, b c, and a ring, D, mounted on a suitable open base, E, and provided with lateral bearings, h h i i, for both, and a supporting bearing, m, for only one of the said grate shanks, substantially as herein described, with or without a fixed grate shank bearing, f.

40,147.—Fire Regulator.—John Rozell (assignor to Felix Campbell and H. Y. Davison), Brooklyn, N. Y. Antedated Sept. 11, 1863:

I claim, first, The combined hollow piston and piston rod, D H E, with the cup-shaped packing, f, all constructed and operating substantially in the manner described

Second, The combination with the upper and smaller head, H, of the hollow piston of the guide rollers, c, arranged and operating substantially as described.

Third, In combination with the hollow piston rod, D, the pointed rod, J, lever, K, and weight, L, constructed, arranged and operating substantially as set forth.

40,148.—Machine for Drying Wool.—Hiram Smith, Worcester, Mass., assignor to J. A. Locke, Watertown, Mass.:

I claim the use, in wool-drying machinery, of an elongated fan extending throughout the whole length of the air chamber and operating substantially as described.

I also claim the distributing board, H, arranged and operating in the manner and for the purpose substantially as set forth.

40,149.—Tile Rack and Cut-off.—Porter L. Sword, Adrian, Mich., assignor to G. S. Tiffany, Palmyra, Mich.:

I claim the combination of the sliding rack with the stationary frame, when arranged to operate substantially as and for the purpose herein specified.

40,150.—Cheese Press.—J. L. Treat, New York City, assignor to himself and M. V. Millar, Oriskany Falls, N. Y.:

I claim the combination of the three levers, B F E E2, and G g, constructed in the manner described, the first two forming clamp jaws, and the whole operating together to constitute an automatic press, as and for the purpose specified.

[This is an ingenious device for compressing a cheese equally on both sides by its own weight.]

40,151.—Breech-loading Fire-arm.—J. H. Wichmann (assignor to Henry Schroder), Oldenburg, Germany:

I claim in combination with a hinged breech piece, recessed on its lower side, the cut-away shaft, and lever, D, for the purpose of throwing up said breech piece to load the arm, allowing it to return to its seat, and firmly locking it there, substantially as and for the purposes herein described.

RE-ISSUES.

1,544.—Forge Fire.—John Evans, New Haven, Conn. Patented March 24, 1863:

I claim, first, An inclosed Lehigh forge fire, substantially in the manner and for the purpose herein set forth.

Second, The arrangement of the hollow water chamber front, D, in combination with the fire-place, B, of a Lehigh fire, A, constructed and applied substantially as and for the purpose set forth.

Third, The combination of the air chamber, G G′, in combination with the fire-place, B, of a Lehigh fire, A, and communicating with the air-supply channel, j, and discharge pipe or tongue, m, the whole being constructed and operating substantially as and for the purpose specified.

1,545.—Grain Separator.—B. T. Trimmer, Rochester, N Y. Patented July 7, 1858:

I claim, first, The combination of the blast or draught tube, D, pocket, P, and screens, a b d, or equivalent, arranged in such a manner that the grain that is carried into the pocket is discharged on to the screens, to be separated with the main portion of grain fed directly thereon, substantially as herein described.

Second, In combination with the blast or draught tube, D, pocket, P, and screens, a b d, or equivalent, I also claim the pivoted double spout, g, arranged in such a manner as to discharge the contents of the receptacle either upon or aside from the screens, to accommodate different kinds and conditions of grain, substantially as herein specified.

Third, I also claim the arrangement of the triple blast or draught tubes, D E F, connected with the fan case, and uniting in a common discharge head, G, the tube, D, being provided with the valve, f, and the tubes, E F, having a valve, h, at their junction, by which arrangement the current of air may be intensified or modified in either or all the tubes, substantially as herein set forth.

Fourth, I also claim the adjustable diaphragm, S, situated in the discharge area, at the outlet junction of the triple blast or draught tubes, in combination with said tubes, D E F, by which means the current of air in either is modified, substantially as described.

Fifth, I also claim the combination and arrangement of the blast generator, B, triple blast tubes, D E and F, and their valves, f h, movable diaphragm, S, with the screen box, J, and return spouts, P and Q, operating conjointly for separating, screening and returning the grain, and for increasing, diminishing and modifying the blasts, for the various purposes required, substantially in the manner set forth.

Sixth, I also claim the adjustable deflector, R, in combination with the screen box, J, for returning the lighter grain through the screens, and resubjecting it to the blast or discharging it as refuse, as described.

Seventh, I also claim giving the screens an unequal reversible, gyratory motion, for the purpose of neutralizing the centrifugal force of

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the grain, and retaining it in the center thereof, in combination with the vertical, vibratory motion, by means of the double reverse acting cranks, n n, arms, s, and springs, m, or their equivalents. arranged and operating substantially in the manner and for the purpose set forth

1,546.—Converting Motion.—C. L. Spencer, New York City. March 4, 1862 :

I claim the use of the spring, I, or its equivalent, in combination with the curved connecting rods, G G, for the purpose of enabling the operating pawls to be so adjusted as to obtain an effect upon the shaft equal to the action of the crank, while the danger of hanging upon the dead point is prevented, substantially as described.

1,547.—Converting Motion.—C. L. Spencer, New York City. Patented March 4, 1862 :

I claim two hubs, each composed of the two parts, G and B, in combination with friction rollers, C, spring, S, and axle, I, so that each of the said hubs may be alternately fixed to said axle, one revolving loosely while the other is clutched and in action, for the purpose of producing a continuous rotary motion, in the manner and for the purpose herein set forth.

EXTENSION.

Mode of operating Brakes for Cars.—Nehemiah Hodge, North Adams, Mass. Patented Oct, 2, 1849. Re-issued March 1, 1853. Extended Sept. 16, 1863 :

I claim a combination of two levers. f f′, a rod, h, two levers, c c′, and rods, d d′, as applied to the brakes, and two windlasses of the car, and operated by either of the windlasses so as to bring down at the same time the brakes of both trucks upon the wheels thereof, with the same or practically the same degree of force, and whether when the car is running on the railway, the axles of one truck, or of the wheels of one truck, are thrown or moved out of parallelism with those of the other truck, or the rubbers or brakes become unequally worn, or of an unequal thickness. as above stated.

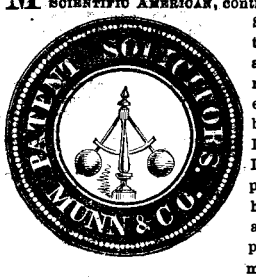
DESIGN.

1,820.—Clock Case.—Elias Ingraham, Bristol, Conn.

IMPORTANT TO INVENTORS,

PATENTS FOR SEVENTEEN YEARS.

MESSRS. MUNN & CO., PROPRIETORS OF THE SCIENTIFIC AMERICAN, continue to solicit patents in the United States and all foreign countries, on the most reasonable terms. They also attend to various other departments of business pertaining to patents, such as Extensions, Appeals before the United States Court, Interferences, Opinions relative to Infringements, &c. The long experience Messrs. MUNN & Co. have had in preparing Specifications and Drawings has rendered them perfectly conversant with the mode of doing business at the United States Patent Office, and with the greater part of the inventions which have been patented. Information concerning the patentability of inventions is freely given, without charge, on sending a model or drawing and description to this office.



THE EXAMINATION OF INVENTIONS.

Persons having conceived an idea which they think may be patentable, are advised to make a sketch or model of their invention, and submit it to us, with a full description, for advice. The points of novelty are carefully examined, and a written reply, corresponding with the facts, is promptly sent free of charge. Address MUNN & CO., No. 37 Park Row, New York.

PRELIMINARY EXAMINATIONS AT THE PATENT OFFICE.

The service we render gratuitously upon examining an invention does not extend to a search at the Patent Office, to see if a like invention has been presented there, but is an opinion based upon what knowledge we may acquire of a similar invention from the records in our Home Office. But for a fee of $5, accompanied with a model of drawing and description, we have a special search made at the United States Patent Office, and a report setting forth the prospects of obtaining a patent, &c., made up and mailed to the inventor, with a pamphlet, giving instructions for further proceedings. These preliminary examinations are made through our Branch Office, corner of F and Seventh streets, Washington, by experienced and competent persons. Many thousands of such examinations have been made through this office. Address MUNN & CO., No. 37 Park Row, New York.

HOW TO MAKE AN APPLICATION FOR A PATENT.

Every applicant for a patent must furnish a model of his invention if susceptible of one ; or, if the invention is a chemical productions he must furnish samples of the ingredients of which his composition consists, for the Patent Office. These should be securely packed, the inventor's name marked on them and sent, with the Government fees, by express. The express charge should be pre-paid. Small models from a distance can often be sent cheaper by mail. The safest way to remit money is by draft on New York, payable to the order of MUNN & CO. Persons who live in remote parts of the country can usually purchase drafts from their merchants on their New York correspondents ; but, if not convenient to do so, there is but little risk in sending bank-bills by mail, having the letter registered by the postmaster. Address MUNN & CO., No. 37 Park Row, New York.

The revised Patent Laws, enacted by Congress on the 2d of March, 1861, are now in full force, and prove to be of great benefit to all parties who are concerned in new inventions.

The duration of patents granted under the new act is prolonged to SEVENTEEN years, and the Government fee required on filing an application for a patent is *reduced* from $30 to $15. Other changes in the fees are also made as follows :—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Re-issue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design, three and a half years	$10
On filing application for Design, seven years	$15
On filing application for design, fourteen years	$30

The law abolishes discrimination in fees required of foreigners, excepting natives of such countries as discriminate against citizens of the United States—thus allowing Austrian, French, Belgian, English, Russian, Spanish and all other foreigners except the Canadians, to enjoy all the privileges of our patent system (but in cases of designs) on the above terms. Foreigners cannot secure their inventions by filing a caveat; to citizens only is this privilege accorded.

During the last seventeen years, the business of procuring Patents for new inventions in the United States and all foreign countries has been conducted by Messrs. MUNN & CO., in connection with the publication of the SCIENTIFIC AMERICAN; and as an evidence of the confidence reposed in our Agency by the inventors throughout the country we would state that we have acted as agents for at least TWENTY THOUSAND inventors! In fact, the publishers of this paper have become identified with the whole brotherhood of inventors and patentees at home and abroad. Thousands of inventors for whom we have taken out patents have addressed to us most flattering testimonials for the services we have rendered them, and the wealth which has inured to the inventors whose patents were secured through this office, and afterwards illustrated in the SCIENTIFIC AMERICAN, would amount to many millions of dollars! We would state that we never had a more efficient corps of Draughtsmen and Specification Writers than those employed at present in our extensive offices, and we are prepared to attend to patent business of all kinds in the quickest time and on the most liberal terms.

REJECTED APPLICATIONS.

We are prepared to undertake the investigation and prosecution of rejected cases on reasonable terms. The close proximity of our Washington Agency to the Patent Office affords us rare opportunities for the examination and comparison of references, models, drawings, documents, &c. Our success in the prosecution of rejected cases has been very great. The principal portion of our charge is generally left dependent upon the final result.

All persons having rejected cases which they desire to have prosecuted, are invited to correspond with us on the subject, giving a brief history of the case, inclosing the official letters, &c.

CAVEATS.

Persons desiring to file a caveat can have the papers prepared in the shortest time by sending a sketch and description of the invention. The Government fee for a caveat, under the new law, is $10. A pamphlet of advice regarding applications for patents and caveats, printed in English and German, is furnished gratis on application by mail. Address MUNN & CO., No. 37 Park Row, New York.

FOREIGN PATENTS.

We are very extensively engaged in the preparation and securing of patents in the various European countries. For the transaction of this business we have offices at Nos. 66 Chancery lane, London ; 29 Boulevard St. Martin, Paris ; and 26 Rue des Eperonniers, Brussels. We think we can safely say that THREE-FOURTHS of all the European Patents secured to American citizens are procured through the Scientific American Patent Agency, No. 37 Park Row, New York.

Inventors will do well to bear in mind that the English law does not limit the issue of patents to inventors. Any one can take out a patent there.

Circulars of information concerning the proper course to be pursued in obtaining patents in foreign countries through our Agency, the requirements of different Government Patent Offices, &c., may be had gratis upon application at our principal office, No. 37 Park Row, New York, or any of our branch offices.

ASSIGNMENTS OF PATENTS.

Assignments of patents, and agreements between patentees and manufacturers are carefully prepared and placed upon the records at the Patent Office. Address MUNN & CO., at the Scientific American Patent Agency, No. 37 Park Row, New York.

It would require many columns to detail all the ways in which inventors or patentees may be served at our offices. We cordially invite all who have anything to do with patent property or inventions to call at our extensive offices, No. 37 Park Row, New York, where any questions regarding the rights of patentees will be cheerfully answered.

Communications and remittances by mail, and models by express (prepaid), should be addressed to MUNN & CO., No. 37 Park Row, New York.

Notes and Queries

E. J., of N. H.—Your idea for plating vessels is not new. The Ordnance Bureau is now experimenting on this very idea, and are to practice with a target this week. Commodore Porter has a patent on the use of India-rubber between plates, as you suggest. The owner of a patent of an improvement on a common patented article cannot use the article improved in connection with the original, without the consent of the original patentee, if he is obliged to infringe the first patentee's claims in using his improved implement.

D. P., of N. Y.—We have received your letter, but it is too long for a communication. It is an important subject, as you say, but more suited to the columns of a daily paper. We may be able to refer to the subject, but not at length.

C. E. L., of Mo.—Your article on "Moral Science applied to Labor" is not suited to our columns; but if it were we could not endorse the theory, that Government, as a grand central power, should have control of the labors of the farmer. If you will read Dr. Chalmer's Bridgewater treatise "On the Designs of God in Human Society," you will think differently on such subjects.

J. S. A., of D. C.—The article on cast steel, to which you refer, was not published in the SCIENTIFIC AMERICAN.

W. E. P., of Mich.—The largest steel cannon manufactured in the United States, so far as we know, was by Norman Wiard, of this city. It was a 50-pounder and weighed 7,000 pounds.

J. J. B., of Iowa.—The loss of energy in a steam engine by wire-drawing the steam in its passage from the boiler to the cylinder, is inappreciable, according to the experiments of D. K. Clark on locomotives. He states that the area of the steam pipe should not be less than one-tenth the area of the piston, when the speed of the piston does not exceed 10 feet per second. Theoretically, there is some loss of energy by the friction of the steam in wire-drawing, but the amount has never been determined. When the esistance to the work of an engine is diminished, the best method of economizing the power of the steam is by cutting off rather than by wire-drawing. The initial pressure should not be lowered in the cylinder.

J. B., of Ind.—The loadstone is a magnetic oxide of iron, found in many parts of the world. It abounds at a hill called the iron mountain, not far from St. Louis, Mo.; but the most powerful natural magnets of the kind are found at Magnet cove or valley, near the Washitaw hot springs, in the State of Arkansas. The peculiar property of the loadstone was first observed in specimens of an oxide of iron found near Magnesia, a city of Lydia, in Asia Minor, and hence the name of magnetism has been applied to the phenomenon to which it appertains. Its polarity and attractive properties are daily witnessed in the needle of the mariner's compass, and in the little tack hammers used by some saddlers and upholsterers. Cobalt and nickel are the only metals besides iron which are known to be affected by the magnet. The sulphuret of iron, commonly called iron pyrites, often possesses magnetic properties. Its form is in acicular crystals of a beautiful bright golden color; and many a simple man has been deceived with them in supposing he had discovered a gold mine ; verifying the trite proverb—"All is not gold that glitters."

M. B., of Vt.—Artesian wells are so called from the department in France where they were first made—the district Artois, called Artesium by the Romans. The water is generally tepid, but excellent to drink when cooled. The deepest in the United States is 4,000 feet, at Columbus, Ohio. One in Louisville, Ky., in Messrs. Dupont's paper mill, throws a jet more than 40 feet high: the water of which is impregnated with salt, much resembling the Blue Lick water of Kentucky, and similar to that of many German *brunnen* and *quelle*. It is much used for drinking and for bathing in.

A. J. D., of Ky.—The cultivation of the Chinese tea plant has been attempted with only partial success in several parts of the United States. In South Carolina, Tennessee, Texas and California it has flourished, but the insuperable obstacle to its general cultivation is want of cheap labor. The substitutes for the China tea, in the New world, are numerous. In almost every part of South America the *mate* is used for it. Mate is a species of holly called by naturalists *ilen paraguayensis*. In North Carolina and the adjoining States an infusion of the yopon leaves is the common tea. In New England many aromatic garden herbs are made into tea. In the Middle and Western States the spring table drink is sassafras tea, made of the root bark of the very common laurus sassafras. Tea and coffee may both go out of use one of these days, in America, and something indigenous be used instead.

S. F. H., of N. H.—The lunar tidal-wave is the moving swell caused by the moon's attraction of the waters of the ocean. Its periods change with the position of the moon in her orbit. The most accurate information respecting the tides on the American coast is contained in the reports of the "Coast Survey."

B. W., of N. Y.—Chemically pure bismuth, tin, lead, &c., are not to be found in our markets. You may have such metals rendered pure, however, by Professor C. Seely, chemist and editor of the *American Journal of Photography*, this city.

Money Received.

At the Scientific American Office, on account of Patent Office business, from Wednesday, Sept. 30, to Wednesday, Oct. 7, 1863 :—

H. M., of N. Y., $25; E. W. S., of N. J., $25; W. T. E., of N. J. $25; A. W. H. of Ill., $41; A. T., of N. Y., $16; W. V. M. K., of N. J., $16; L. M. S., of Ill., $20; B. F. S., of Iowa, $20; A. McK., of N. Y., $20; A. S. M., of Ill., $20; J. R. S., of Pa., $20; E. B. N., of N. Y., $16; G. S., of N. Y., $16; T. C., of R. I., $46; S. R., of N. Y., $25; J. H. Q., of N. J., $15; J. L. L., of Pa., $25; J. G., of Ind., $16; C. S. W., of Mass., $16; J, B., of La., $10; E. H. G., of N. Y., $25; F. J. T., of Md., $16; A. P. P., of Conn., $63; P. & S., of N. Y., $23; H. G. G., of N. Y., $44; J. L., of N. Y., $16; J. A., of N. Y., $16; C. M., of N. Y., $16; H. & S., of Pa., $20; T. H., of Cal., $20; T. H. B., of Mass., $20; G. G., of N. Y., $45; J. W. H., of N. Y., $90 W. K., of N. Y.. $20; R. H., of N. Y., $20; D. W. S., of Conn., $16; J. E., of N. Y., $92; G. W. H., of Pa., $25; S. & B. of Ill., $500; J W. S., of Ill., $16; D. and K., of Cal., $15; C. B. G., of Iowa, $16; H. A. A., of N. Y., $25; W. W., of N. J., $25; B. & B., of N. Y., $25; D. G. G., of N. Y., $16; L. C., of N. Y., $20; J. B., of N. Y., $20; P. M., of Ill., $20; C. C. W., of Pa., $45; W. R., of N. Y., $45; H. I. D., of Ill., $20; E. S., of N. Y., $16; H. M., of N. Y., $44; M. H. F., o N. Y., $30; J. C. B., of Conn., $19; C. S., of N. Y., $12; S. B. H., of Mass., $16; D. R. P., of Mass., $26; J. B. A., of Ill., $15; A. H. G., of N. J., $25; E. St. J., of N. Y., $16.

Persons having remitted money to this office will please to examine the above list to see that their initials appear in it, and if they have not received an acknowledgement by mail, and their initials are not to be found in this list, they will please notify us immediately, and inform us the amount, and how it was sent, whether by mail or express.

H. M., of N. Y.; A. P. P., of Conn. (2 cases); P. & S., of N. Y., E. C., of N. Y.; H. G. G., of N. Y.; T. C., of R. I ; E. H. G., of N. Y.; S. R., of N. Y.; C. S., of N. Y.; J. L. L., of Pa.; A. W. H., of Ill.; H. A A., of N. Y.; W. W., of N. J.; B. & B., of N. Y.; E. C , of N. Y.; H. M., of N. Y.; D. R. P., of Mass.; A. H. G., of N. J.; E. P., of Ohio; G. W. H., of Pa.; H. G. G., of N. Y.; E. W. S., of N. J.; W. T. E., of N. J.; A. W. H., of Ill.; T. F. H., of N. Y.; R. B. L., of Ohio; P. G., of Mo.; T. J. E., of Ind.; D. C. M., of Nevada; R. T. S., of N. Y.

Specifications and drawings and models belonging to parties with the following initials have been forwarded to the Patent Office from Wednesday, Sept. 30, to Wednesday, Oct. 7, 1863 :—

Back Numbers and Volumes of the Scientific American

VOLUMES I., II., III., IV., V., VII. AND VIII. (NEW SERIES) complete (bound) may be had at this office and from periodical dealers. Price, bound, $2 25 per volume, by mail, $3—which includes postage. Every mechanic, inventor or artizan in the United States should have a complete set of this publication for reference. Subscribers should not fail to preserve their numbers for binding. VOL. VI. is out of print and cannot be supplied.

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Models are required to accompany applications for Patents under the new law, the same as formerly, except on design patents when two good drawings are all that are required to accompany the petition, specification and oath, except the Government fee.

RATES OF ADVERTISING.

Twenty-five Cents per line for each and every insertion payable in advance. To enable all to understand how to calculate the amount they must send when they wish advertisements published, we will explain that ten words average one line. Engravings will not be admitted into our advertising columns, and, as heretofore, the publishers reserve to themselves the right to reject any advertisement hey may deem objectionable.

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In one volume octavo, with illustrations, price $2. Copies sent free by mail on receipt of price. Published by D. VAN NOSTRAND, 192 Broadway, New York. 15 2

ORDNANCE OFFICE.

WAR DEPARTMENT.
Washington, Oct. 2, 1863

Sealed proposals will be received at this office until the 30th day of October next, for banding and bushing the 42-pounder guns, at the forts and arsenals of the United States in the Atlantic States, amounting in number to 200, more or less.

The guns will be delivered at, and removed from, the establishment where the work is to be done at the cost of the United States.

Proposals for those on the Pacific Coast—about 50 in number—will be received until the 10th of December next; and in the case of these, the guns will be delivered at San Francisco or its vicinity.

The guns are to be turned down to a true cylinder for the length of twenty-seven inches from the rear of the base ring, prepared to take a band of the best wrought-iron, the interior diameter of which will be twenty inches, and its thickness three inches.

The vent is to be bushed with a new bush of pure ingot copper, one inch in diameter and about nine and a half inches long, and bored with a vent of two-tenths of an inch.

Drawings of the gun in its original form and with the band put on can be seen at this office, at the Watertown Arsenal, Mass.; at the Watervliet Arsenal; and at the New York Agency, No. 45 Worth street, city of New York; at the Arsenal at Bridesburg, Pa.; and at Allegheny Arsenal, Pittsburg, Pa.; at the Fort Monroe Arsenal, Va.; St. Louis Arsenal, Mo.; and Benicia Arsenal, Cal.

The work is to be done to the entire satisfaction of the officer who will be appointed to superintend it; and payment will be made in full for each gun upon his certificate of inspection and receipt.

Proposals will state the price per gun for the whole operation; describe in detail the manner in which it is proposed to put on the band; the number they will band per month; and the time which will be required to do the whole work. The method and the time required for doing the work, as well as the price, will be important elements in considering the bids and awarding the contract.

No bids will be considered from any parties but such as are actually engaged in the manufacture of iron and heavy machinery, and who are, in the opinion of this Department, fully prepared to execute the work. In the case of parties not known to this Department, evidence to the foregoing effect must accompany the proposal.

Bond, with satisfactory sureties, to the amount of fifty per cent. of the bid, will be required for the fulfilment of the contract; and the Government reserves the right to reject any or all bids, if deemed unsatisfactory.

Proposals will be endorsed "Proposals for Banding 42 Pounders," and will be addressed to Brigadier-General George D. Ramsay, Chief of Ordnance, Washington City.

GEO. D. RAMSAY,
163 Brigadier-General, Chief of Ordnance.

TO SHIP-BUIDERS.—A NAVAL ARCHITECT AT present engaged on iron-clads building in London, is desirous of an engagement in America. Thirteen years experience in all classes of merchant ships and a thorough knowledge of all the different constructions of European armor-cased war-vessels, will render his services of value. Address NAVAL ARCHITECT, care of Messrs. Delizy, Davies & Co., 1 Finch Lane, Cornhill, London, E. C. 16 3

HICKOK'S PATENT KEYSTONE CIDER AND WINE MILL.—12,000 in use and approved. If your merchant does not keep them, tell him to send for one for you, or write to the manufacturer yourself. Address W. O. HICKOK, Eagle Works, Harrisburg, Pa. 16 2*

PAYE'S PATENT FORGE HAMMER.

This hammer is adapted to both heavy and light forgings; the force of the blow being entirely at the will of the operator, and for all forgings under six inches, both round or square, is the best hammer now in use, and requires but one-half the power used by every other hammer to do the same work. For an engraving and description of this hammer see page 1, Vol. V. (new series) of the SCIENTIFIC AMERICAN; some valuable improvements have, however, been since made. All communications should be addressed to H. M. AMES, Box 422, New York, or Ames Iron Works, Oswego, N. Y.

These hammers may be seen in operation at the Allaire, Neptune, Secor, Delamater, Fletcher & Harrison, Duncan & Crampton, Anderson & McLaren, Duhurst & Emerson, Charles T. Porter, Hudson River Railroad Car Shop, all in New York city; Joseph Colwell, Jersey City; Wm. White, Newark, N. J.; Providence (R. I.) Tool Co.; Whiting & Wilcox, Kaighn's Point, Phila.; Mallory & Cottrell, Mystic, Conn.; J. Dillion, Rondout; James Horner & Co., Sing Sing; Henry Esler & Co., Brooklyn; James B. Eads, St. Louis, Mo.; Franklin Iron Works, Central Railroad Shop, Albany; Burlington, Quincy & Chicago Railroad Shop, Ames Iron Works, Oswego; C. P. & A. Railroad Shop, Cleveland, Ohio. 1*

TO SKATE-STRAP MANUFACTURERS AND DEALERS.—Sprague's Patent Lever Buckle, warranted to be in all respects the best and cheapest Lever Buckle in use. Manufacturers will do well to examine these buckles before using any other. Samples sent by mail to any part of the country. For sale by F. M. SHEPARD, 347 Broadway. 16 4*

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FOR HUB-MORTISING MACHINES, SPOKE PLANERS, Blanchard Lathes and Wheel Machinery, address J. A. FAY & CO., Worcester, Mass. 1*

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A VALUABLE WORK FOR INVENTORS PATENTEES AND MANUFACTURERS.

The publishers of the SCIENTIFIC AMERICAN have just prepared, with much care, a pamphlet of information about Patents and the Patent Laws, which ought to be in the hands of every inventor and patentee, and also of manufacturers who use patented inventions. The character of this useful work will be better understood after reading the following synopsis of its contents:—

The complete Patent Law Amendment Act of 1861—Practical Instructions to Inventors, how to obtain Letters Patent, also about Models—Designs—Caveats—Trade-marks—Assignments—Revenue Tax—Extensions—Interferences—Infringements—Appeals—Re-issues of Defective Patents—Validity of Patents—Abandonment of Inventions—Best Mode of Introducing them—Importance of the Specification—Who are entitled to Patents—What will prevent the Granting of a Patent—Patents in Canada and European Patents—Schedule of Patent Fees; also a variety of miscellaneous items on patent law questions.

It has been the design of the publishers to not only furnish, in convenient form for preservation, a synopsis of the PATENT LAW and PRACTICE, but also to answer a great variety of questions which have been put to them from time to time during their practice of upwards of *seventeen years*, which replies are not accessible in any other form. The publishers will promptly forward the pamphlet by mail, on receipt of six cents in postage stamps.

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E. C. STRANGE, MANUFACTURER AND DEALER IN Box Board, Stave and Shingle Machines, Stave Jointers, Cutting Off, Planing and Crozing Machines, Nail-keg and Barrel Heading Machines, Nail-keg, Barrel and Hogshead Hoop Sawing Machines, No. 20 Broadway, Taunton, Mass. 15 3*

WATER WHEELS.—WARREN'S TURBINE WHEEL and improved oil stop, is acknowledged by cotton and woolen manufacturers, and those who are making the greatest saving in the use of water, to be superior to all other wheels in the country. For illustrated circular, address A. WARREN, Agent, American Water Wheel Company, No 31 Exchange street, Boston, Mass. 14 12*

ANDREWS' PATENT CENTRIFUGAL PUMPS FOR all liquids, hot or cold. The most simple, durable and economical power pumps made. Will pass 25 per cent of sand and gravel without injury. For price lists address the manufacturers, WM. D. ANDREWS & BRO., 414 Water street, New York.

N. B.—Pumps kept for hire, engineers and power furnished; for wrecking, coffer dams, sewers, cellars and sand pumping. 14 8*

SECOND HAND IRON PLANERS FOR SALE.—ONE fourteen feet bed, three feet between uprights, weighs about 6½ tuns. Cost $1,250 and is nearly new. Also, one five feet bed, has been used about six months. Also a good suspension drill. Also a new hand lathe, iron bed, swing 25 inches. Address GEORGE GAGE & SON, Waterford, N. Y. 16 2*

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TO INVENTORS.—ANY PARTIES HAVING ANY improved method of manufacturing fine-cut tobacco, either in the machinery, or in the preparation, or of increasing the weight of the same, causing it to keep in a damp state, can sell their discovery at a good price by addressing F. P. C., "Tobacconist," New York city. 13 4*

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WOODWORTH PLANERS—IRON FRAMES TO PLANE 18 to 24 inches wide, at $100 to $120. For sale by S. C. HILLS No. 12 Platt-street, New York. 1a

LANE'S PATENT LIFTING JACK—VERY EASILY operated, compact, simple and cheap. For cut and description see page 405, Vol. VIII. (new series), SCIENTIFIC AMERICAN. Staet rights for sale. Communications in relation to rights or orders for Jacks may be addressed to J. G. LANE, Washington, N. Y. 10 8*

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AMESSIEURS LES INVENTEURS.—AVIS IMPORTant. Les inventeurs non familiers avec la langue Anglaise, et qui préféreraient nous communiquer leurs inventions en Français, peuvent nous addresser dans leur langue natale. Envoyez nous un dessin et une description concise pour notre examen. Toutes communications seront reçues en confidence.

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SEWING MACHINES.—GROVER & BAKER'S NEW Lock-stitch Machine, No. 9, 495 Broadway. This is the best and cheapest machine for Tailors' use ever produced. Price $45. 13 13

ANDREW'S PATENT OSCILLATING ENGINES ARE light, strong, cheap and economical, leave the shop ready for use, and require no special foundation. 11 sizes are made, from 1 to 60 horse-power, and larger sizes to order. WM. D. ANDREWS & BRO., Manufacturers, 414 Water street, New York. 14 8*

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Zur Beachtung für deutsche Erfinder.

Die Unterzeichneten haben eine Anleitung, die Erfindern das Verhalten angibt, um sich ihre Patente zu sichern, herausgegeben, und verabfolgen solche gratis an dieselben.

Erfinder, welche nicht mit der englischen Sprache bekannt sind, können ihre Mittheilungen in der deutschen Sprache machen. Skizzen von Erfindungen mit kurzen, deutlich geschriebenen Beschreibungen beliebe man zu addressiren an

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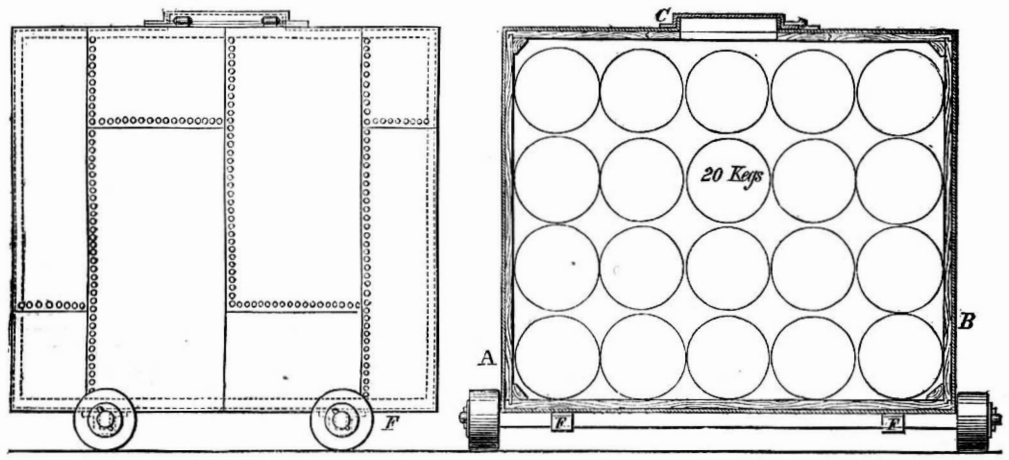
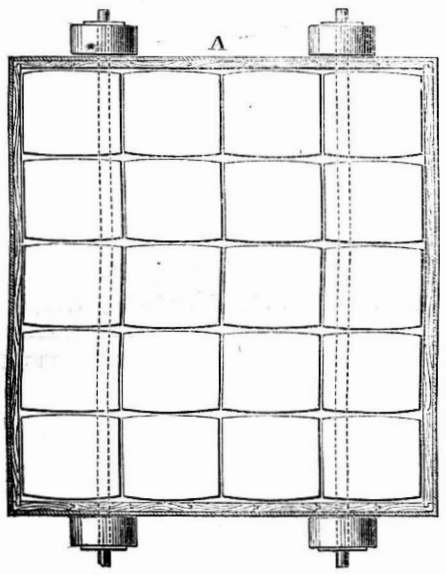
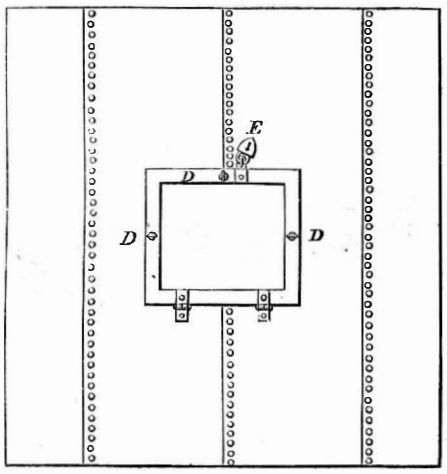
A NEW TUMBRIL CAR.

The Ordnance Department has kindly transmitted us the following plan of a tumbril car, designed for transporting gunpowder and magazine stores upon railways. It is intended to make this class of freight on which all railways demand extra risks absolutely secure against accidents. Appended is a description of the invention :—

A square box is made of 8-inch thick boiler-iron firmly riveted together. This is lined inside with oak planks; the bottom to be 2 inches thick; the sides and top 1½ inches thick. On the two sides, A and B, the planks run upright, so as to stand the lateral pressure of the filled barrels best. In the center of the top there is a charging door, 26 by 24







inches in the clear. The boiler-iron of the car is turned up 2½ inches high. The door is turned down correspondingly, and has besides, flanges all around, which are 2½ inches wide, and are covered below with vulcanized india-rubber strips ¼ of an inch thick, which fit closely on the top of the car, on which the cover is screwed down tight, by means of three screws, D D D, which work on the principle of the powder-tank-covers. Besides this the cover is locked by a padlock, E. The axles of the trucks are 2 by 3 inches, and are riveted to the cars by the two bands, F F. The ends of the axles are turned to a diameter of 2½ inches, and receive the trucks of lignum-vitæ, which have 12 inches diameter and are 4 inches thick. A middle-sized platform car of our railroads would accommodate three such cars, which on their travel will stand crosswise. One tumbril car will hold 80 barrels of powder, or a corresponding quantity of fixed ammunition. All rivets or bolts penetrating to the interior of the oak lining should be of bronze, to the total exclusion of iron. The door is located so as to give superior accommodations for charging and use of the inside space, while its make does not leave open questions about absolute security. (Signed) A Cluss.

Office of Ordnance Yard, Sept. 17, 1863.

The sale of the library of the late Henry Thomas Buckle, author of the "History of Civilization in England," realized between seven and eight thousand dollars.

Keeping Verbenas Over Winter.

A correspondent of the *Horticulturist* says :—"My 'better half' has no difficulty in keeping the verbena in the house through the winter; with her the question has been how to keep verbenas in the open border. After many experiments she has succeeded the past winter, by placing over the plant a frame made for protecting cucumber hills, having in it a 10 by 15 glass. The verbena remained in fine condition, fresh and green, all winter, was uncovered early in April, then growing vigorously, and on the 10th of May was in full bloom. Those kept in the house are potted in the fall early enough to root well before freezing weather comes on; they are then placed in the east windows of our sitting room, where we have wood fires, and never allow the frost to enter. The plants are kept clean and moist; tobacco smoke (which I can apply whenever called upon) applied when necessary, and thus the plants are kept healthy and vigorous through the entire winter. This spring they commenced blooming the last of March, were in full bloom by the middle of April, and now are in the garden as bright and beautiful as one can desire. If one will but pay attention to the plants, it is easy to see whether they are suffering from dust, want of moisture, or insects, when the proper remedy can be applied, and the plants kept in a healthy state."

Autumn Planting of Strawberries.

A correspondent of the *Country Gentleman* says :—"All growers of strawberries in the region around New York, make the most extensive autumnal plantings between the 20th of September and the 20th of November. We plant new beds until the ground is closed by frost, and always with success. Professor Huntsman says his most successful plantings are those that are made latest. Such as are planted the latter half of November we cover with a layer of sedge, straw or hay, not for the purpose of keeping it in when the ground becomes frozen; as by thus shutting out the sun's rays we cause the ground to remain permanently frozen during the winter. We find that it is not the permanent cold that injures the plants, but the thawings, which draw out many plants so that their roots become exposed, and are then winter-killed.

Great Spectroscope.—The *Chemical News* (London contains a brief description of the most powerful spectroscope ever constructed and applied to the spectrum. It has nine prisms filled with the bisulphide of carbon, giving 2¼ inches aperture, with telescope of corresponding size. This instrument has established the following points :—that the lines of the solar spectrum are as innumerable as the stars of heaven; it shows distinctly ten times as many lines as are given by Kirchoff in his chart, and an infinitude of nebulous bands just on the point of being resolved; it proves that the coincidences between the bright lines of the metallic spectra and the dark lines of the solar spectrum remain permanent; and it shows that many of the bands of the metallic spectra are broad colored spaces crossed by bright lines.

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The SCIENTIFIC AMERICAN has the reputation, at home and abroad, of being the best weekly journal devoted to mechanical and industrial pursuits now published; and the proprietors are determined to keep up the reputation they have earned during the eighteen years they have been connected with its publication.

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The SCIENTIFIC AMERICAN will be found a most useful journal to them. All the new discoveries in the science of chemistry are given in its columns, and the interests of the architect and carpenter are not overlooked; all the new inventions and discoveries appertaining to those pursuits being published from week to week. Useful and practical information pertaining to the interests of millwrights and millowners will be found published in the SCIENTIFIC AMERICAN, which information they cannot possibly obtain from any other source; subjects in which planters and farmers are interested will be found discussed in the SCIENTIFIC AMERICAN; most of the improvements in agricultural implements being illustrated in its columns.

To the Inventor!

The SCIENTIFIC AMERICAN is indispensable to every inventor, as it not only contains illustrated descriptions of nearly all the best inventions as they come, but each number contains an Official List of the Claims of all the Patents issued from the United States Patent Office during the week previous; thus giving a correct history of the progress of inventions in this country. We are also receiving, every week, the best scientific journals of Great Britain, France and Germany; thus placing in our possession all that is transpiring in mechanical science and art in those old countries. From those journals we shall continue to transfer to our columns copious extracts of whatever we may deem of interest to our readers.

To the Mechanic and Manufacturer!

No person engaged in any of the mechanical pursuits should think of doing without the SCIENTIFIC AMERICAN. It costs but six cents per week; every number contains from six to ten engravings of new machines and inventions which cannot be found in any other publication. It is an established rule of the publishers to insert none but *original* engravings, and those of the first class in the art, drawn and engraved by experienced artists, under their own supervision, expressly for this paper.

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FROM THE STEAMPRESS OF JOHN A GRAY & GREEN,

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